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Like Water and Oil

THE report that representatives of the medium-sized mines in Bolivia, consisting of non-nationalized undertakings running on private capital, have appealed to the Government and the National Stabilization Council on the grounds that the industry is in an extremely precarious position.

Close observers of the Bolivian mining scene will not be surprised at this assertion. No more than two months ago a team of U.S. mining experts sent to Bolivia by the New York Engineering mining firm of Ford, Bacon and Davis reported that the production of tin, lead silver, antimony and copper from nationalized Bolivian mines had deteriorated in a serious manner over the past three years. The team's assignment was to determine how mining could make a maximum contribution to Bolivia's economy. Their considered view of the reasons underlying the rapidly worsening situation in Bolivia's mining industry were due essentially to the deterioration of equipment, low efficiency, shrinkage of working capital, deficiency of technical and administrative personnel and the closure of mines during the years 1953-54.

The team's report now published analyses in some detail the points at issue in the present situation.

1.—The mining industry in Bolivia is responsible for more than 50 per cent of the total Bolivian income. Therefore, a reduction in the output of ores must have a serious effect on the country's economy.

2.—The general economic situation of the industry has deteriorated seriously in the past three years due to significant falls in the yields of tin, lead, silver, antimony and copper and only a moderate rise in the yield of tungsten.

3.—Working capital has fallen and the condition of equipment and installations in the mines has deteriorated so that a high percentage—25 per cent—of the industry is now non-profitmaking. Efficiency is low and there is a strong shortage of administrative and technical personnel. Also, there is a general lack of discipline among workers.

4.—More than 1,600 mines closed between 1953 and 1954 despite the high prices for ore at that time.

5.—In the past three years, the private mining industry suffered further losses.

6.—More important Bolivian mines will have to close down in the future due to exhaustion of their ore deposit; and unless new deposits are found, further serious declines in output will occur.

7.—Mines which are uneconomic are continuing operations and so wasting capital and labour.

8.—Production will decline and costs increase as many of the important mines make investments to develop and extend their operations.

9.—Many of the larger and older mines are encountering problems such as falls in ore content, complex ores and increases in rock pressures.

10.—The system of taxation and "invisible" taxes on the net product of sales is adversely affecting the life of the mines.

11.—There are social and political problems to be solved. A strong effort is needed to re-establish relations between labour administration, investors and the government.

12.—The workers can obtain greater benefits only through an increase in output and greater efficiency.

13.—Hopes of increasing the output from Bolivia's mines depends mainly on strengthening the private mining industry and to do this a climate propitious to investment must be created.

14.—The capital needed to make the mining industry self-supporting is estimated at $7,500,000 annually for the next five years. Capital to this extent cannot be found in Bolivia.

All in all, these points led to the general conclusion that unless the Bolivian government separates political activities from the administration of the mines, the entire mining industry would continue to suffer the consequences. Unfortunately, we have not been able to find any evidence that the Bolivian government is prepared to create the conditions required to infuse fresh life into the country's mining industry, and thus the outlook for the continued viability of the economy must now be in doubt.

Of course, the spectacle of government viewing its mining industry as a milch cow is not new. It can only be hoped that the disasters rapidly overtaking Bolivia will be taken to heart in other mining centres in the world where the extraction of valuable raw materials is more and more being used to fatten the government's coffers without thought to the foreign investor, who, in the majority of cases, has been responsible for there being any mining industry at all.

It goes—almost without saying—that the team, in its reports, suggested that the way to increase mine yield was to strengthen the private mining industry by creating attractive conditions for private investment.

"A ROCK BY ANY OTHER NAME . . ."

The crux of the confusion currently existing in the classification of ore reserves arises from the fact that the basic notions and the terms describing those notions do not have the same meaning for everyone. Indeed, the geologist, the miner and the economist regard a deposit of ore from widely different viewpoints, considering the deposit itself and its potential usefulness from completely individualistic points of approach. With these considerations in mind a report by F. Blondel and S. G. Lasky, published in *Economic Geology*, Volume 51, No. 7, fulfils a definite need by clarifying the traditional terms used in the classification of ore reserves.

Added to the difficulties arising from phraseology, any estimate of the mineral productivity of a deposit or of a region depends on at least two factors. First, the limit accepted for economic possibilities of exploitation. For a single mine, this is usually expressed as a minimum mineable, or cut-off, grade; for a region, in which each mine may have its own cut-off grade, the limitation has to be expressed in more general terms. Second, the degree of certainty desired for the estimate itself; that is, whether the estimator wishes to include only proved reserves or would include also the progressively less certain categories of probable and possible reserves.

Thus there is no such absolute entity as "the" reserves or resources of a mine or an area. There are only estimates applicable within particular economic limitations and degrees of certainty.

Reserves are thus only part of the total resources. The rest consists of that mineral material which, to be exploited, demands conditions more favourable than those currently existing, as well as further exploration to bring into consideration undiscovered products not currently included under the terms "possible", or "inferred". For this remainder the term "potential ores" is suggested although it is recognized that realism will usually impose a limit in revaluation of such material.

Accordingly the equation is offered:

Resources = reserves + potential ores

It is useful to introduce a sub-division of "potential ores". Following the economist's terminology these might be referred to as marginal resources. Beyond the marginal deposits are those masses that require conditions even more favourable but still, in the opinion of the miner and the metallurgist, within reach, and to these are assigned the term "sub-marginal resources", again using the term fixed in both mining and economic terminology. The rest, that is the part of the potential ores that may be exploited in the more distant future of the economist, Blondel and Lasky propose to name "latent resources".

The equation then becomes:

Resources = reserves + marginal resources + submarginal resources + latent resources.

The appraiser can thus be guided by either equation, depending upon the information available and upon the purpose of the appraisal.

Restriction should be placed on the term "reserves". The authors consider that masses or deposits susceptible to profitable exploitation only during periods of high prices should not be considered as constituting "reserves", even during the period of exploitation, but should be considered only as "marginal resources".

The miner's usual classification is of proved, probable and possible ore, in decreasing order of certainty. It is impossible to get a common definition of these terms. Definitions that meet the specifications desired have been given by C. K. Leith and the author's recommend their common acceptance.

By these definitions, proved or assured ore is described as that ore blocked in three dimensions by actual underground mining operations or by drilling, but it includes in addition minor extensions beyond actual openings and drill holes where the geological factors that limit the orebody are definitely known and where the chance of failure of the ore to reach these limits is so remote as not to be a factor in the practical planning of mine operations.

Probable or semi-proven ore covers extensions near at hand, where the conditions are such that ore will probably be found but where the extent and limiting conditions cannot be so precisely defined as for proved ore. Semi-proven may also mean ore that has been cut by scattered drill holes, but too widely spaced to assure continuity.

Ore is classed as possible or prospective where the relations of the land to adjacent orebodies and to geologic structures warrant some presumption that ore will be found but where the lack of exploration and development data precludes anything like certainty of its actual location or extent. Often it is not desirable to assign figures to possible tonnages, but they may be designated by terms like small or large.

This classification, however, applies only to the need of the miner. There is needed also a classification for the man who would assess the present reserve position or the resource position of a whole industry or of a region or a nation. Such assessments are composed of a summation of estimates of individual mines and districts, expanded by geologic and economic judgment. The need in a national appraisal is not for accurate measurement, but for an appreciation of magnitude.

For this purpose, the staffs of the U.S. Bureau of Mines and the U.S. Geological Survey, in assessing the mineral position of the United States in 1944, used a classification of "measured", "indicated", and "inferred" reserves. The definitions of these terms are described in the following paragraphs:

Measured reserves are those for which tonnage is computed from dimensions revealed in outcrops, trenches, workings and drill holes and for which the grade is computed from the results of detailed sampling. The sites for inspection, sampling, and measurement are spaced so closely and the geologic character is so well defined that size, shape, and mineral content are well established. The computed tonnage and grade are judged to be accurate within limits which are stated, and no such limit is judged to be different from the computed tonnage or grade by more than 20 per cent.

Indicated reserves are those for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. The sites available for inspection, measurement, and sampling, are too widely or otherwise inappropriately spaced to permit the mineral bodies to be outlined completely or the grade established throughout.

Inferred reserves are those for which quantitative estimates are based largely on broad knowledge of the geologic character of the deposit and of which there are few, if any, samples or measurements. The estimates are based on an assumed continuity or repetition, of which there is geologic evidence; this evidence may include comparison with deposits of similar type. Bodies that are completely concealed may be included if there is specific geologic evidence of their presence. Estimates of inferred reserves should include a statement of the specific limits within which the inferred material may lie.

It is worthy of note that these categories are analogous to proved, probable and possible, but they are too general and have too large a margin of error to satisfy the practical business needs of the miner. The authors therefore suggest that the terms "measured" and "indicated" be abandoned and be replaced by a single term that will include them both.

The term "demonstrated" reserves is suggested in contradistinction to "inferred" reserve. Demonstrated reserves are those for which tonnage and grade are computed partly from specific measurements, samples, or production data and partly from projection for a reasonable distance on geologic evidence. They may include some orebodies concerning which the sites for inspection, sampling, and measurement are spaced so closely and the geologic character so well defined that size, shape, and mineral content are well established, and other orebodies concerning which the sites available for inspection, sampling, and measurement, are too widely or otherwise inappropriately spaced to permit the bodies to be outlined completely or the grade established throughout.

MORE COAL LESS ABSENTEEISM

During the first quarter of this year the production of coal in the U.K. exceeded that of the comparable period last year by 1,500,000 tons. This, coupled with lower inland consumption, has resulted in much higher stocks than a year ago and the solid fuel position is looking brighter than for many years. What is of even greater significance is the fact that the average weekly number of workers on the colliery books has increased by 5,000 compared to this time last year and voluntary absenteeism is below the 1956 rate. All this augurs well for the future and perhaps this year will see some significant return for the immense sums of money currently being poured down the shafts.

WIDENING SCOPE OF CONSOLIDATED ZINC

Recent news from Australia reveals that the Consolidated Zinc group is expanding its interests in the Australian mining and metallurgical industries.

The group, through its subsidiary, Titanium and Zirconium Industries (Pty.) Ltd., is now well established in rutile and zircon mining, with a large plant operating on Stradbroke Island, Queensland. Anticipated Australian production of rutile in 1957 is 165,000 tons, but this figure may be affected by the fall in the price for the rutile concentrate and its influence on low grade occurrences.

During 1956 the group announced the discovery of a large deposit of bauxite of a grade suitable for the manufacture of alumina at Weipa on the West Coast of the Cape York Peninsula in Queensland. As a first step towards an organization to develop these resources, a new company, Commonwealth Aluminium Corporation Pty. Ltd., has been formed, with which the British Aluminium Co., Ltd., will be associated.

Consolidated Zinc acquired the Sulphide Corporation Ltd. in 1948. This company has completed plans for the extension of its plant at Cockle Creek, New South Wales, at a cost of £A8,000,000. The plans cover the establishment of a zinc smelting plant, the gases from which will be utilized to increase the production of sulphuric acid and superphosphate manufacture. The ultimate objective is the production of 47,000 tons of zinc metal per year, and will bring the output of the existing superphosphate works to 430,000 tons per year. It is expected that surplus sulphuric acid, to the amount of 45,000 tons, may be sold to industries in the Newcastle district. The new zinc smelter will use a new process developed by the Imperial Smelting Corporation in the United Kingdom.

A factor in the plan is the completion of a satisfactory long-term arrangement for the transport of zinc concentrates from Broken Hill to Cockle Creek, over the New South Wales railways. Subject to this arrangement, the first smelting unit should be in production within three years. The projected works extensions will assist the coal mining industry to the extent of 75,000 tons of coke per year. Hitherto, Consolidated Zinc has been selling part of its zinc concentrate to Electrolytic Zinc Co. of Australasia Ltd. for treatment at the Risdon, Tasmania, works, but it is considered that the two smelters combined would be unable to cope with the concentrate available.

The Tasmanian company, Electrolytic Zinc Co. of Australasia, which produces metallic zinc from Broken Hill concentrates, and also from concentrate from its own mines on the West Coast of Tasmania, has added a new flash roasting furnace to the plant at Risdon, at a cost of £A1,000,000. It is the fourth such roaster put into use and will provide sufficient roasting capacity for the production of 115,000 tons of metallic zinc annually. The new equipment also means that the roasting on the mainland of zinc concentrate for the Risdon works can be discontinued, as all necessary roasting will now be done at Risdon. A third contact acid plant is to be built at the works, which will raise acid production to 170,000 tons per year.

The new zinc smelting project of Consolidated Zinc at Cockle Creek will eventually supply the resulting deficiency in New South Wales' acid production, but in the meantime, ample supplies of pyrite are available.

Canada's Uranium Boom

BY dint of excellent prospecting and courageous financing, and thanks to a rich country and a reasonable political climate, Canada, by 1958, will lead the Western world in amount of ore reserves and rate of production of uranium. This remarkable record was achieved within the period of the past three to four years. In figures, this means that by next year Canada is expected to produce an estimated 22,000 tons of uranium oxide annually. By 1958, the Blind River field alone, with a production of about 14,000 tons of oxide annually, is expected to produce almost as much oxide as the entire United States, and twice as much as South Africa, the other free world leaders in this field. In brief, Canada is now assured of an internationally important rôle in the fast-approaching atomic age.

In about three years there has been discovered and developed across Canada several billion dollars' worth of new wealth. About twenty large new mines have been brought to production or early production. These new private enterprise mines, together with the Crown-owned Eldorado mines, have contracted to produce and deliver over one-and-a-half billion dollars' worth of uranium oxide within the next five to six years. This means that uranium by 1958 will become the metal of greatest gross value produced in Canada. The annual value of Canadian uranium oxide production will be close to $400,000,000 and will exceed the combined 1955 value of all lead, zinc and copper produced in the Dominion. It will be almost double the value of all Canadian nickel production for the same year. It will, in fact, be exceeded in value only by Canada's total oil production, and not by a very wide margin. The capital financing necessary to effect this production amounts to almost $379,000,000. Some $80,500,000 will be distributed annually in labour costs to operate and manage the mines.

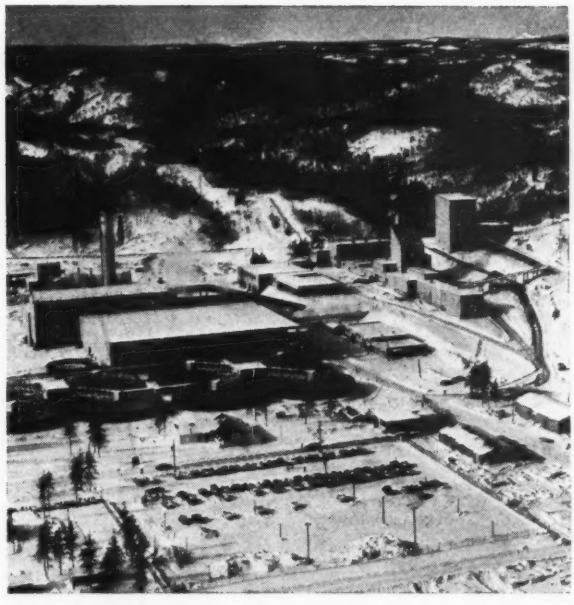
In a paper presented to the Prospectors' and Developers' Convention on March 4, 1957, Mr. F. R. Joubin outlined the developments that have taken place in recent years in the Canadian uranium industry. The following article is a précis of his remarks.

On the provincial level, Canada's uranium wealth is reasonably well distributed. Most uranium occurrences of importance are found along the edge of the precambrian shield that crosses the Northwest Territories between Great Bear and Great Slave lakes, dips across Northern Saskatchewan near Lake Athabaska, crosses Manitoba diagonally near Lake Winnipeg, and crosses Ontario and Quebec near their south boundaries. From west to east the districts of importance are Port Radium, Marion River, Beaverlodge, Blind River or Algoma, and Bancroft. There is one somewhat isolated deposit in south central British Columbia that will probably become a producer. There are, of course, almost countless prospects between the above-named districts.

The Port Radium district is the birthplace of Canada's uranium industry, and supports one Eldorado-owned mine. The Beaverlodge district is Canada's second most important uranium production area. Beaverlodge will be responsible for almost $310,000,000 worth of oxide production during the next five to six years. The only company, Eldorado, that has extensively developed its large holdings, is believed to have very considerable reserves of moderate grade ore.

Above: Pronto Uranium Mines Ltd.
Opposite: The Algom Nordic Mine

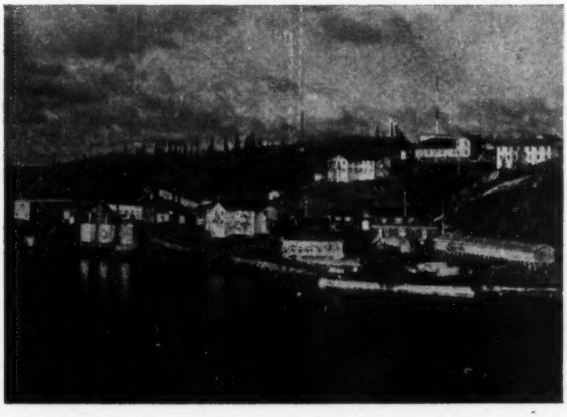
Opposite: The Algom Quirke Mine
Below: Eldorado Mining at Beaverlodge



Ontario has enjoyed the most spectacular success in recent uranium developments. These developments have been spectacular for several reasons, namely the size and number of the ore-bodies and resultant mines and the speed with which discoveries, development and production have been reached. The areas of importance in Ontario are the Blind River (or Algoma) and the Bancroft fields.

The Bancroft district, situated less than 160 road miles from Toronto, ranks as Canada's third most important uranium district. It is expected to contribute $142,000,000 worth of oxide towards present sales commitments.

The Blind River district, which should more correctly be called the Algoma district, will soon be Canada's first-



ranking uranium camp. The eleven large mines of that district are expected to produce over $1.1 billion or almost 70 per cent of Canada's uranium oxide over the next five to six years of production. Starting with 1958 this will amount to over $280,000,000 per year. This in turn is more than 80 per cent of the value of all copper, nickel and platinum produced in the entire Sudbury district last year.

It is unfortunate perhaps that all Canadian producers have contracts that terminate together within a period of a few months, rather than being staggered over a period of a few years. Those few months between March, 1962, and March, 1963, are regarded by some as having the sudden impact of a cataclysm. Yet there are many factual indications, being added to daily, that point the market trend after 1962-63. One thing is certain; the Western world will still need uranium oxide, in increasing amounts during many years to come. Dr. Willard F. Libby, until recently of the U.S. Atomic Energy Commission, and a specialist in developing nuclear power reactors, has stated that "a phenomenal growth" will be seen in the atomic power field between 1962-1972. By 1980 Dr. Libby has estimated that the Western world requirements will be at least 40,000 tons and possibly as much as 100,000 tons of uranium oxide annually. Free world production after 1958 is estimated at 35,000 tons of oxide annually. The power applications of the atom are moving swiftly, and events like the present Suez Canal - Near East oil problem simply emphasize the need for more and more speed in power reactor development.

When this development comes, probably within the next three years, the free foreign market for uranium should prove important to Canada with its large relatively low-cost deposits. By late 1961, if not earlier, many of the country's large plants will be amortized; they will still be relatively modern and although efficient now, will be even more efficient then. It is confidently expected that present Canadian milling costs, now about one-half of American costs, will be reduced. Several Canadian mines have ore reserves for a score of years; at least two in the Algoma field claim two-score years. Some Canadian uranium mines may prove to have recoverable by-product metals such as the rare earths, thorium and pyrite. A probable producer of columbium in Ontario may reverse this order and produce uranium as a by-product.

When considering the future, there are some who ask, "What will be the rôle of the Crown-owned Eldorado company after 1963?" and this is an interesting question. Up to the present, and dictated by early necessity, the Eldorado company has been prospector and producer on its own account, and refiner and marketing agent for everyone, themselves included. One would have logically expected that, after private enterprise had so successfully demonstrated its ability in the field, Eldorado would have been content to rest on its well-earned reputation and limit its several present rôles to the one or two of greatest national good.

Eldorado's conduct, however, has been the opposite of the expected. They have leased and developed "private enterprise ore"; they are presently trebling their mill capacity at Beaverlodge; they remain the sole refiners in Canada; and soon will be in the metal production business. One cannot help but wonder what the outcome will be if, as we are sometimes officially warned, there may be production dislocations when present American contracts end. How would a smaller volume of American contracts be allocated by Eldorado, as between private enterprise producers and its own mines? If curtailment or termination of American contracts resulted in refinery problems in America, how would the inadequate capacity of the Eldorado-owned Port Hope refinery be allocated, as between private enterprise and Eldorado's own production? How will the approaching overseas supply contracts be allocated, as between private enterprise producers and the Eldorado mines?

None of these problems can be foreseen as arising in the near future because they will only appear with a diminishing market and it seems probable that we will enjoy an expanding market for the next two decades at least.

Accumulation of Methane During Mining Operations

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Recently the U.S. Bureau of Mines completed a study confined to approximately 150 working faces in 26 collieries of the north-eastern coal fields. The purpose of these studies was fourfold; namely to determine the accumulation of methane gas in the kerf during cutting, to ascertain if an explosive mixture of gas does occur at the face during the operation of a continuous miner, to discern the effectiveness of the face ventilating procedures now followed, and to suggest possible means of minimizing the accumulation of methane gas during cutting and continuous mining. The tests were described and the conclusions arising therefrom presented, in "Report of Investigations 5288", from which this article is condensed.

IF gas is present in a coal bed and surrounding strata, it will generally be released during the course of mining; and if the general pattern of ventilation is applied where the conventional machine is employed, the release and build-up of methane should not differ greatly throughout the United States.

In cutting machine operation in gassy mines, methane detectors, Riken capable of detecting 0 to 10 per cent methane and W8 capable of detecting 0 to 5 per cent methane, were used in conjunction with a connecting intake rubber tube to reach the back of the kerf, the tube being supported by an extensible (sectional) metal pipe; a device in which a vacuum bottle could be fitted, pushed to the rear of the kerf, and the bottle inlet-neck broken so samples of the kerf atmosphere could be obtained.

The percentage of methane (if present) at the face was determined before cutting was begun. The percentage ranged from 0 to 0.2 depending upon liberation from places upstream from the test site. Similar tests were made in the kerf when the sump was completed, when the cut was half complete and when completed, and when each shear cut was completed.

In the gassy mines visited the split of air (section split) available for ventilating the working faces was adequate, ranging from 15,000 to 64,000 cu. ft. of air per min., to dissipate any gas present. The sub-split of air coursed to the faces of developing entries ranged from 1,000 to 14,500 cu. ft. per min. In wide rooms from 5,500 to 17,600 c.f.m. The line brattice was maintained from 5 to 25 ft. from the faces. The percentage of methane in the kerfs ranged from 0 to 35.0.

Position of Line Brattice

It was determined by actual test very early in the study that the face end of a line brattice must reach the face to be effective in sweeping gas from the kerf and that rather large volumes of air (1,000 cu. ft. and more) will not enter the kerf if the line brattice is as much as 5 ft. from the face.

Where methane was released rather readily from the coal as it was broken during cutting, the following observations were made:

(a) The kerf fills with methane from back to front presumably at a rate depending on rate of gas release;

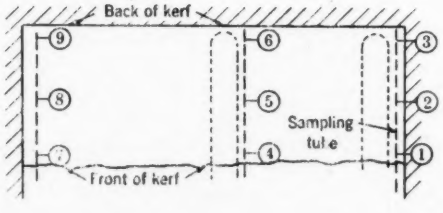
(b) At even a slow rate of release, as determined by tests, where line brattice is 10 ft. or more from the face, an explosive mixture of methane and air may form during the time required to cut a place a maximum of 45 minutes;

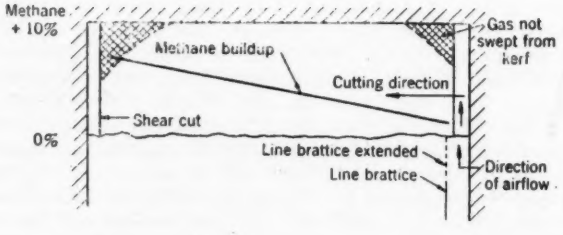
(c) A shear cut releases methane entrapped in a bottom cut, even where ventilation is poor owing to distance of line brattice from face. However, gas may remain in the shear cut;

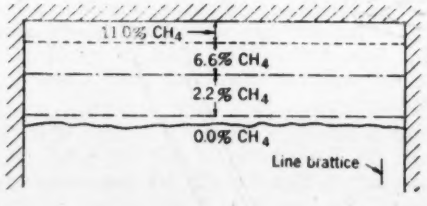
(d) If a shear cut is directly in front of an intake-air line brattice, it assists in removing methane from the horizontal cut and shear;

(e) When line brattice is extended to the face, the air current must enter the kerf and so coursed will sweep the kerf free of methane accumulations. Conversely, a gap of as little as 5 ft. from the face to line brattice may result in ineffective sweeping of the kerf;

(f) To be effective in sweeping methane from a kerf, the sweep of the air current across the face and the cutting operation should be in the same direction; the sweeping effect was greatly enhanced when line brattice was on the intake side of the working place;







Above : The sample points as cutting progresses

Centre : Methane accumulation as cutting progresses

Below : Accumulation of methane after cut is completed

(g) Tests showed that even in mines where considerable methane was liberated and the kerf filled with methane from back to front during sumping and as cutting across the face progressed a line curtain to the coal face with as little as 1,000 cu. ft. of air a minute will sweep the kerf clear of methane, except possibly in the remote corners; and

(h) Where methane is liberated to any extent, it is a reasonably safe assumption that an explosive mixture of gas and air will exist at some point between the front and back of the kerf. The methane at the back of the kerf may well be above the explosive limit, but tests showed a decrease in percentage from back to front of the kerf.

In the gassy mines where methane is liberated in kerfs, the following precautions will minimize a methane build-up in the kerf. First the line curtain should deliver intake air to the sump side of the face so that the air sweep will follow the cutting as it progresses across the face, and the line brattice should be within the machine-clearance distance of the face before cutting operations are begun and extended to the face as soon as the sumping operation provides enough space. A loose fold of brattice cloth of sufficient length should be maintained at the inby end of the line curtain for this purpose.

Where a side shear is made, the shear should be on the line-curtain side of the face to take advantage of the sweeping action of the intake air. A rapid build-up of methane in a kerf has been considered desirable by some mining men, since the methane will not explode in concentrations above 15 per cent, or the upper explosive limit; this, however, is an erroneous theory since the less methane present the less will be the extent of an ignition. It is considered better practice to dilute the methane and have a smaller quantity explode in the event of an ignition because, even in high-liberation kerfs, invariably an explosive mixture will exist near the front of the kerf, and there is no assurance that the source of ignition will be in methane concentrations too high to explode rather than in the explosive-range area.

Operation in Gassy Mines

Since there should be little difficulty in ventilating a face by conventional means where the ripper-head-type continuous miner is used, the study was confined to the boring type where the bulk of the head mechanism tends to deflect the air current away from the coal face. However, to verify the foregoing conclusion, one study was made of a ripper-head-type machine in a very gassy mine. Most of the studies were confined to development work where gas emission should be greater; this conclusion was found to be true, as no pillar study disclosed gas liberation of consequence. Methane detectors, potentiometer, thermocouple, anemometer, thermometer, measuring tape, watch, vacuum-type air-sample bottles, and rubber tubing were used in making the various tests.

Generally, an area in a mine where methane is encountered frequently was selected for a test, although studies were made where methane had not been detected to determine conditions in relatively non-gassy areas or areas where methane had been dissipated.

Ventilation practices generally observed throughout the mines studied was the conventional check curtain or check door in combination with line brattice to direct the air to the working face. About the only difference at the various mines was in the volume of air available for distribution, the effectiveness of the line-brattice installation, and the distance it was maintained from the face.

In most high-coal mines visited the line brattice was not extended beyond the rear of the machine, and when the machine had moved 10 ft. the brattice cloth was extended, the end of the brattice being maintained 20 to 30 ft. from the face. In low-coal mines, since it is common practice to make a sump cut and then a slab or widening cut, the line brattice may or may not be extended into the sump-cut area before the slab cut is made. Extension of the line brattice results in a better circulation of air at the face during the slab cut.

The conclusions reached show that it is deemed impracticable, owing to the bulk of the boring-type continuous miner commonly used in high-coal mines, to keep the line brattice closer than the rear of the machine, which is at least 20 ft. from the working face. At this distance even large volumes of air are deflected from the face by the head of the machine and do not properly sweep the face to remove methane as the coal is broken.

Danger of Free Liberation

Where methane is liberated freely, an explosive mixture of gas and air may exist at the face even when 2,000 cu. ft. of air is coursed to within 20 ft. of the face. Under actual operating conditions only a source of ignition, such as a spark from a machine pick, was needed in three different mines to ignite gas and in one instance possibly to result in an explosion.

A line brattice, the acceptable device used to-day for conducting air to a working face, as generally installed, does not keep the face free of explosive mixtures of air and gas; therefore, to ventilate beyond the line brattice an auxiliary system of exhausters or blowers and exhausters, possibly connecting to tubing and attached to the machine, should be tested.

In the low-coal area, better face ventilation may be attained by making the sump cut on the line-brattice side of the place so that brattice may be extended into the sump space before the slab cut is made. Temperature changes at the face did not appear particularly important in so far as the data obtained are concerned. The use of of a methane alarm on continuous mining machines should also be considered.

To avoid overlooking any possible hazard during this investigation, some studies were conducted in the so-called non-gassy mines, primarily to determine if methane is seldom found because of good ventilation or if those faces ventilated only with difficulty and worked by boring type miners are hazardous.

Both top and bottom cutting were studied in several coal beds in the vicinity of gassy mines, but no explosive concentration of methane was disclosed. The ventilation in many instances was not particularly good, since no means was provided to direct the air from the last crosscut to the face, yet the methane released in the kerf did not build up to an appreciable extent even when places remained idle for as long as twenty minutes, an apparently normal lapse between cutting and blasting.

If methane in any appreciable quantity is released during mining it should be liberated at faces where continuous miners are employed owing to the speed of opening a virgin coal area. Only a few mines rated as definitely non-gassy employed these machines, and the maximum found during the studies was 0.15 per cent. Unquestionably some methane is liberated from coal during continuous mining operations.

Next Step in Baffinland Survey

AN aircraft is being fitted with electronic gear and cameras at Oshawa Airport, near Toronto, for the most northerly commercial mapping expedition to be performed for the Canadian government.

In a matter of months, lattice photographic coverage of some 40,000 sq. miles of Baffinland will be obtained. Much of the area is north of the magnetic pole. The mapping resulting from the programme of which this operation is a part, will be the basis of more detailed mapping in the future. The widespread mineral discoveries made almost continually in Canada ensure that the expedition will be watched with marked interest.

The Photographic Survey Corporation, of Toronto, has been awarded a contract to continue the government's Shoran-controlled survey of Canada's northlands, which was begun in 1947 by the Canadian Geodetic Survey. All of Canada south of the Arctic coastline has been filled in with a geodetic net of accurate ground positions established by Shoran methods with supporting photography of the area. It will be necessary to establish several secondary Shoran base stations within the geodetic net to assure accurate positioning of the photographic exposures.

Kenting Aviation Ltd., PSC's operating company, will be responsible for the flying of this operation. The installation of the airborne Shoran equipment for the expedition is being done by a sister company, Field Aviation Co. Ltd. Shoran is a distance measuring equipment, operating on very high frequency, capable of a precision better than 25 ft. in 100 miles. Shoran is a contraction of the words " short range navigation ".

A New Technique

This year, PSC's own mapping aid, the airborne profile recorder, will be used for the first time in a Shoran-controlled survey. This adaptation of a radar altimeter to elevation and seale control of mapping has been under a continuing development programme since 1949. APR originated as an experimental design in the National Research Council at the request of the RCAF. The value of the technique was immediately appreciated by PSC and a number of improvements have been incorporated.

A B-17 Flying Fortress will be used for the first time in a survey of this type in Canada. Supporting it will be a Canso amphibian for bringing out the crews and equipment after the ice break-up; a DC-4 for airlifting the personnel and material to Foxe Inlet on Melville Peninsula in May; and a DC-3 Dakota to relay them to eight Shoran sites, all of which will be occupied simultaneously.

The base of the expedition will be an airstrip at Foxe Inlet, north of Hudson Bay and some 2,000 miles due north of Toronto. At Foxe the photographs taken on day-to-day flights at heights up to 28,000 ft. and spaced at intervals of approximately 20 miles, will be processed and then inspected by a government official. Film processing will be done at Foxe and the film will be forwarded as frequently as possible to Toronto where copies on glass plates will be made in the laboratories of PSC. The unit at Foxe, however, must be self-contained so that processing, checking of data, plotting and decisions of reflights can be carried out on location.

The operation airlift begins in early May with the actual photography starting about June 1 when enough ice melts off Baffinland to make photography practicable.

Manganese Occurrences in Southern Rhodesia

PROBABLY the largest body of manganese ore known in Southern Rhodesia is that on the property of the Riscom Steelworks, near Que Que, formed of residual concentrations and replacement deposits. At this locality the south-east striking iron ore-bearing jaspilite is thrown westwards about a mile along a strong fault which brings it close to the east bank of the Que Que river, and it is at this point that a moderate concentration of manganese ore occurs. Manganese ore is also exposed in an old quarry near the road leading from the steelworks to Que Que.

It seems possible that these two occurrences will yield a few thousand tons of manganese ore. Samples from the first two 5-ton loads mined in the Que Que river body analyzed respectively 12 per cent SiO_2, 39.9 per cent Fe, 14.8 Mn, and 11.9 per cent SiO_2, 31 per cent Fe, 24.5 per cent Mn. Since a marketable ore of manganese needs to assay not less than about 45 per cent Mn it appears that this ore is likely to be of value only to the Que Que steelworks.

Other Occurrences

At the Dan claims, situated some eight miles south-west of the Riscom Steelworks, manganese ore was located in the course of drilling for iron ore in a belt of country striking NW-SE with steep north-easterly dips. One hole showed ore for the first 40 ft. from surface assaying 46 per cent MnO_2, and subsequent development work exposed a body 110 ft. long and 65 ft. wide averaging 29 per cent Mn and 25 per cent Fe. Approximately 25,000 tons of this ore exists above the 40 ft. level.

In the Lomagundi district manganiferous ores have been found in limited quantities at two principal localities. One of these is on the farms Maysma and Dumalan, about 23 miles WNW of Sinoia. A sample analyzed contained MnO 68.75 per cent (i.e. Mn 43.44 per cent). The country rocks are slaty types belonging to the Lomagundi System.

The other locality lies about 32 miles SW of Sinoia near the Wasanji river and two hills named Gadzira and Nyatsengwe, in the Magondi native reserve. The ore is stated to be pyrolusite. Surface prospecting here is rendered difficult by the large quantities, in the underlying rocks, of earthy graphite which superficially resembles pyrolusite. Very large tonnages of this graphite, certainly several million tons, occur in the synclines at Gadzira and Nyatsengwe hills. The country rocks belong to the Lomagundi System and the occurrence deposits themselves are presumable vein deposits.

Significance of Iron Deposits

On Killarney Farm in the Gwelo district pockets of wad occupy solution cavities and basins in crystalline limestone of the Basement Complex. From these superficial masses about 195 tons of manganese ore were sold during 1948 and 1949, but reserves are insignificant.

It is not unlikely that in those places where there is a concentration of iron ore there will often also be a concentration of manganese, as there is at Que Que Steelworks. Such may be the case, for example, in the Buhwa Range in the Belingwe District, where drilling for iron ore is now in progress, and in the Manesi Hills north-west of Enkeldoorn.

Machinery and Equipment

New Unit Finds Sulphide Minerals

The Ronka Ground EM unit, a new portable electronic tool for the prospector which combines modern electronic techniques with proven prospecting methods, has been proved in over a year's operational and experimental service by various companies. The electromagnetic device was introduced early in March at the Prospectors' and Developers' annual convention in Toronto.

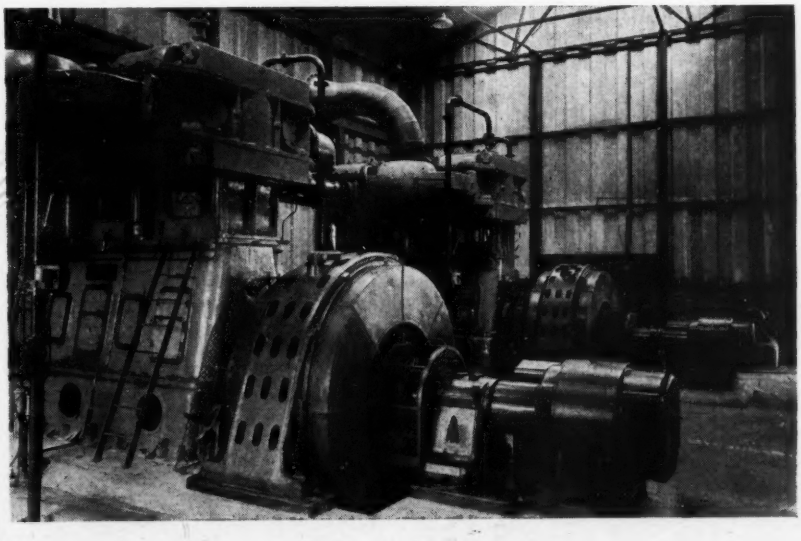
This electromagnetometer was developed by Vaino Ronka, an electronics engineer with Aeromagnetic Surveys Ltd., of Toronto. A new associated company, Ronka Geophysical Instruments, has been formed to produce the Ronka Ground EM and other new devices.

The lightweight Ronka Ground EM can be easily carried and operated by two men. It will be of most service in accurately locating and detailing sulphide bodies detected in the first instance by airborne EM methods. Materials other than sulphide bodies can show up as an anomaly on the airborne EM equipment. The ground EM survey will assist in distinguishing these materials from commercial sulphides. The use of the diamond drill, while conclusive, is an expensive method of confirming the presence of such sulphides.

The Ronka Ground EM unit makes use of two horizontal electromagnetic loops rather than a vertical loop. The developers claim that the horizontal loop equipment is more portable, is cheaper to operate and is faster than the vertical loop equipment. Powered by flashlight batteries, it can survey up to five miles of picket line in a day. The equipment is simple to operate and no special skills are required to plan and carry out a survey.

The equipment consists of two coils or "loops" which are suspended around the waists of the operators by shoulder harnesses. The prospector carrying the receiver coil also carries the receiver compensator console and is equipped with earphones. His companion wearing the transmitter coil operates the equipment with a switch. He is connected to the receiver by a cable 200 ft. long, stretched taut in operation. The principle of operation is much the same as that used so successfully with airborne EM equipment and, indeed, with the familiar wartime mine detector. A number of leading mining companies have purchased the new Ronka Ground EM equipment, which they are operating themselves.

Above is the new Ronka Ground E.M. unit used to detect lead, zinc and copper deposits, while below are shown AX Auto-synchronous motors by Crompton Parkinson driving an air compressor in a South Wales colliery. These two machines were part of an order for twenty units



ELECTRICAL EQUIPMENT FOR MINING

Throughout 1956 Crompton Parkinson Ltd. maintained their supply of electrical equipment to the mining industry. A large N.C.B. project for which C.P. switchgear was extensively used was that at the recently-commissioned Avenue Site carbonization plant at Wingerworth, Chesterfield. For this project a total of 81 switchgear units was supplied. This equipment comprised the power house l.v. board, l.v. switchgear units in five distribution substations, h.v. and l.v. boards in the East Midlands Electricity Board substation. and the tar plant l.v. main board and l.v. ring main board. For another N.C.B. project, the development of the Manvers Main Colliery and carbonization plant, both C.P. transformer and C.P. switchgear were involved on a large scale. The transformers vary in size from 110 kVA to 1,500 kVA and are employed for 11kV/3.3kV, 3.kV/550V, 550/110V and 110/550V transformation.

Notable exports of a.c. motors included nearly 700 machines for the Canadian British Aluminium Co. and nearly 300 more machines for the Kitimat Works of the Aluminum Co. of Canada. (C.P. had previously supplied some 600 motors for the latter mentioned project).

Among the large orders for switchgear was one for a 17-panel, 11 kV duplicate busbar, truck cubicle switchboard with a remote control board and another covering similar equipment, but of single-busbar design, for installation in India; a repeat order for 24 3-unit ring main equipments for use in Rhodesia; and orders from South Africa for a 13-unit, 6.6 kV duplicate busbar switchboard, for 145 isolating switches and for 30 11 kV metalclad units.

MEASURING IN MINING

An instrument that will measure distance by day or by night, whether visibility is good or not, has been invented in South Africa and is to be marketed in the U.K.

It is claimed to be the most important development in surveying since the theodolite. If such be the case, the tool has obvious applications in mining, particularly during the prospecting or development periods.

Known as the Tellurometer, its accuracy is said to be such that the distance between London and Reading could be measured with an error not likely to exceed seven inches.

The Tellurometer system is based on a method of measuring the time radio waves take to travel from one point to another. To measure a single line, one master and one remote station are necessary, the measurements being made from the master station. More than one remote station can be used in conjunction with the same master if several distances are to be measured.

The instrument is being manufactured by Tellurometer (Pty.), of Cape Town, and will be marketed by Cooke Troughton and Simms.

MINING MISCELLANY

New deposits of aluminium oxide have been discovered in Lower Aragon, Spain. It is claimed that the mineral extracted contains 48 per cent alumina.

★

The Marinduque Iron Mines Co., Philippines, planned to start copper production last month in Sipalay, Occidental Negros. A net monthly production of 1,670,000 lb. copper is expected.

★

In 1956 Svenska Skifferolje A.B. (the Swedish Shale Oil Co.) produced 27,700 cu. m. of petrol, 69,000 cu. m. of fuel oil, 29,200 tons of sulphur, 9,500 tons of gasol and 40,300 tons of limestone.

★

The Priority Drilling Co., of Dublin, a subsidiary of a Canadian mining concern, has been asked to undertake a survey of mineral deposits in the Ardara region of Donegal.

★

The French government has created by a decree a body known as the Organization for the Kouilou-Pointe Noire Industrial Region, to co-ordinate research, draw up development programmes and see them carried out in the French territories of the Middle Congo, in Equatorial Africa.

★

The American Lithium Institute has initiated a programme of sponsored research on lithium alloys at the Massachusetts Institute of Technology and on lithium containing glass at Pennsylvania State University. The Institute will also establish fellowships.

★

More than £2,000,000 worth of electrical equipment of every description will be shown at this year's national Electrical Engineers' Exhibition, to be opened by Lord Hailsham, Minister of Education, at Earl's Court on April 9. The exhibition will be the largest display of British Electrical equipment ever staged in this country.

The London helicopter company Autair will this year be operating in Africa with one of the latest types of helicopter, a specially designed Bell 47 G2. Autair plan to carry out flying tests and practical demonstrations in East Africa to prove the value of such machines to governmental and commercial organizations. Autair will in particular be demonstrating to organizations carrying out survey and geological exploration work.

★

In Bombay the Atomic Energy Department is reported to have discovered what is believed to be one of the world's largest deposits of radioactive ore "somewhere in north-east India". Surveys are understood to show that the deposit contains more than 3,300,000 tons of ore containing 300,000 tons of 10 per cent thorium, 10,000 tons of uranium of 0.3 to 0.4 per cent concentration, and a considerable tonnage of ilmenite.

PERSONAL

Mr. A. R. O. Williams, Mr. J. B. Davis, Mr. G. J. Mortimer, Mr. A. C. Wilson, Mr. P. H. A. Brownrigg and Mr. H. St. L. Grenfell have joined the board of the South West Africa Company. Mr. J. E. W. Lomas, Mr. A. Ellinger, Sir Eric Young and Mr. A. Lyell have left the board.

★

Mr. C. F. S. Taylor has resigned from the board of Selection Trust and from the London advisory committees of Roan Antelope Copper Mines and Rhodesian Selection Trust.

★

Mr. L. C. Walker has ceased to be a director of the Rhodesian Corporation.

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Mr. R. H. C. Boys has joined the board of Rhodesian Anglo American. Mr. H. St. L. Grenfell has left the board.

★

The Mining World Limited appears in the list of new company registrations for March. The directors of the company are Mr. F. G. Chisholm and Mr. C. W. A. Ison. Mr. Chisholm and his brother Mr. A. J. Chisholm, have for many years been the proprietors of the *Mining World*, published in London. Mr. C. W. A. Ison is a director of Exploration Co. Ltd., Investigations and Management Ltd., Molyneux Finance Co. Ltd. (formerly Molyneux Gold Dredging Co. Ltd.) and South American Exploration Co. Ltd. (a wholly-owned subsidiary of Ashanti-Obuasi Reefs Ltd.).

★

A new mining and civil engineering division has been formed by Uddeholm Ltd. for the sale of Uddeholm carbide rock drill steels in the U.K. Mr. C. G. Middup is general manager of the new division.

★

A European Congress on Ground Movement will be held from April 9-14, 1957 at the University of Leeds.

The first copper from Northern Rhodesian producers arrives at Lobito for export. This consignment comes from Nkana

CONTRACTS AND TENDERS

The I.C.A. has announced the following future authorizations :

India

Coal tubs and tipping tubs for National Coal Development Corporation (Private) Ltd. Last date for submitting tender : 13/4/57. Tender notice : 36/57 - J.B. C.T.T. Signatory S. K. Ghosh, chief purchase officer, 1 Council House Street, Calcutta. Ref. : E.S.B./8223/57. Telephone : Chancery 4411, Extension 738 or 771.

India

Gravity concentration, flotation, magnetic separation and washing equipment for ores and minerals (chromite and manganese), output 30-50 tons of conc. per day; machinery for wet and dry grinding, capacity 50-100 tons per day; vacuum filters for china clay refining; sludge pumps and slime pumps; pilot plant for extraction of elemental sulphur from pyrites. Not known when orders to be placed. Ref. : E.S.B./7382/57. Telephone : Chancery 4411, Extension 738 or 771.

India

Amongst other equipments for porcelain factory, one set of stone crushers and crusher rolling mills, bucket elevator, belt conveyors, wet grinding cylinders, various pumps, air compressor, trucks of many types, kilns, testing plant. Bids to the Director Industries, Bihar, Patna, India. Closing date 1/5/57. Ref. : E.S.B./7456/57. Telephone enquiries. Chancery 4411, extension 738 or 771.

AGENCIES WANTED

Sodeco, 108/110 Boulevard de Grand Ceinture, P.O. Box 5032, Casablanca, Morocco, wish to represent a U.K. manufacturer of rubber conveyor belts. Ref. : E.S.B./4609/57. Telephone : Chancery 4411, Extension 776 or 866.

★

Coal mining equipment for South Africa. Ref. : E.S.B./8726/57. Telephone Chancery 4411, extension 693.

Metals and Minerals

Extraction of Aluminium from Clays

In our issue of October 2, 1956, p. 436, it was reported that the Anaconda Company was to build a $1,000,000 pilot plant to test a new process for extracting alumina from domestic clays in the United States.

The potentialities of this development were discussed in a recent article by Mr. John N. Hoffman, instructor in minerals economics at Pennsylvania University. Writing in the college's monthly bulletin, Mr. Hoffman pointed out that, if the operations at the pilot plant resulted in an economically feasible process, the project would relieve the handicap of the newcomer to the industry of dependence on other producers and at the same time substantially lessen the U.S. industry's present dependence on imported bauxite. The U.S. domestic industry is based on foreign ores. Producers of aluminium are not very enthusiastic about the expense of the ocean haul from present foreign sources, but they have very little choice in the matter. If the industry carries out its plans to expand aluminium production by 700,000 tons in the next four years, it will obviously need far more bauxite ore from somewhere.

The U.S. alone has an estimated (1950) 3,000,000,000 tons of high aluminous clay, chiefly in Central Pennsylvania, the Northwest and the Southeast. These reserves could yield some 350,000,000 tons of aluminium metal, if a process capable of producing alumina at prices competitive with alumina from bauxite ores could be brought into full operation.

Bauxite still has one chance of competing with a process using some other aluminium-rich material. Both in the U.S. itself and overseas there are large lower-grade deposits to be mined whenever new beneficiation and refining processes make it economical to do so.

The article further points out that, while the U.S. could undoubtedly become self-sufficient through a low-cost process for the use of domestic ores, there is little likelihood that such a trend would have any material effect at present on imports. Imports of foreign bauxite are seen as actually increasing so long as international trade remains favourable.

Apart from this potential development, aluminium is headed for an even more important rôle in the operations of Anaconda. In 1955, when its aluminium operations were first started, the company produced 15,000 s.tons. Last year production amounted to 61,500 s.tons from the primary reduction plant at Columbia Falls, where rated capacity is 60,000 s.tons annually.

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A prospecting company, Enterprise Exploration (Pty.), Ltd., has asked the Queensland Government to survey part of the Gulf of Carpentaria for a bauxite port. Suggested survey areas are on the western shores of the Cape York Peninsula.

"URANIUM'S STEPCHILD"

Thorium was described as "uranium's stepchild" by a speaker at the Nuclear Congress in Philadelphia, Mr. Howard E. Kremers, assistant to the president of the Lindsay Chemical Co. Mr. Kremer said that thorium was of interest as a fertile reactor material because of its inherent ability to yield fissionable U-233 in the breeding-type reactor. Until adequate supplies of U-233 are produced by breeding from thorium, however, the use of the latter material in commercial power reactors will be dependent upon that of uranium.

Thorium has some advantages over uranium in breeder reactors, but interest in it for this purpose has lagged, largely because its technology has not been explored as fully as that of uranium. Hence the future of thorium in commercial atomic energy is not clear. It appears that, in at least the near future, the present thorium-rare earth industry in the U.S. has enough potential productive capacity to meet any reasonable anticipated demands for thorium for domestic energy use.

NEW TITANIUM PROCESSES

Of great potential importance to the economics of the titanium industry is a process developed by the U.S. Bureau of Mines on a laboratory scale for the electro-refining of off-grade titanium metal and scrap. Refining is accomplished in a fused-salt electrolyte using off-grade metal as the anode and collecting the purified metal at the cathode.

★

A U.S. concern, the Stauffer Chemical Co., has reported a new process for the production of titanium metal, which has reached the final stage of pilot plant development. Full details have not been disclosed, but it was announced that titanium sponge was being produced from titanium sub-chloride made from titanium tetrachloride. The new process is expected to be adaptable to the production of other metals, including columbium, tantalum and zirconium.

★

The $40,000,000 association of the Allied Chemical and Dye Corporation and the Kennecott Copper Corporation, formed in the U.S. to produce and sell titanium, is to be known as Allied-Kennecott Titanium Corporation. The new company will produce titanium chloride; titanium sponge and titanium billets. Operations are expected to begin late in 1958. Allied's continuous process for making titanium sponge will be used, as well as their method for manfacturing titanium tetrachloride by using titanium slag as the raw material.

★

Quebec Iron and Titanium Corporation is to increase by 60 per cent the production of titanium dioxide slag at its Sorel, Quebec, processing plant. The expansion plans call for the expenditure of over $16,000,000. The increase in slag production is prompted by the growing demand for slag for processing into titanium dioxide pigment and for use in the making of titanium metal.

★

Plant using electronics and remote control is being constructed in West Germany for the new titanium fabrication plant of Imperial Chemical Industries at Waunarllwyd, near Swansea, in Wales. The plant will have an annual capacity of 2,000 tons of double-melted titanium ingots.

★

Plans are reported for the construction of a new titanium ore processing plant on the South Pacific Coast of Mexico by Compania Minera "El Tisur", the Mexican affiliate of Republic Steel.

★

Further declines have occurred in Australian rutile shipment plants. Apart from an isolated sizeable deal to the U.S., the level of fresh demand generally is reported to be low. Moreover, it is believed that European buyers' requirements have largely been covered for some time ahead as a result of last year's good purchases.

RHODESIAN NICKEL

The Rio Tinto Mining Company of Central Africa Ltd. has exercised its option to purchase for a total of £250,000 the mineral rights of the Empress Nickel claims in Southern Rhodesia from Mrs. M. M. J. Leslie under the terms of its agreement with her. It is expected that the drilling programme will be completed within the next few months. A pilot plant is being erected. Should the mine eventuate, the capital cost is to exceed £10,000,000.

★

Arrangements have been made to develop major nickel-copper discoveries in the Cape Smith area of Ungava, Quebec. A group of Canadian mining companies, headed by Little Long Lac Gold Mines Ltd., has reached an agreement with American Smelting and Refining Co. to explore and develop these deposits.

REPAID IN FULL

The Queen Elizabeth has arrived in New York with 2,343 70-lb. bars of silver from the Bank of England, destined for the U.S. government in final settlement of the World War II Lend-Lease loan to the U.K. of 88,000,000 oz.

SOUTH AFRICAN CHROME

Greater demand for South African chrome ore has increased prices by as much as $2 in the past fortnight. It is considered, however, that this increase

does not reflect a firmer market, since demand for South African grades reflects diminishing shipments to the U.S. from other sources.

TUNGSTEN IN THE U.S.

The Bureau of Mines of the U.S. Department of the Interior has issued its preliminary review of tungsten for 1956. U.S. production during the year declined to about 7,135 s.tons of metal in tungsten ore from 7,500 s.tons in 1955. It is noted that the Government purchase of 3,000,000 s.ton units was completed about June 1. During 1956, steel and other alloys accounted for 46 per cent of the consumption of tungsten products; 48 per cent was consumed as pure metal or in carbides.

Dr. J. A. Dunn, Chief Mineral Economist, Bureau of Mineral Resources, Melbourne, has expressed the view that the supply-demand position of tungsten concentrates at the end of 1956 leaves no scope for a reversal in the recent downtrend of prices. However, neither is there justification for assuming a price downslide.

Meanwhile, with a fair amount of enquiry, largely from the Continent, still in circulation and sellers showing some reserve, dealers on the London market are indicating wolfram ore shipment values at around 160s. to 165s. per l.ton unit c.i.f. Europe for minimum 65 per cent material. So far as Britain is concerned, buyers' immediate needs are reported to be finding supplies from Board of Trade stocks.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

The firmer undertone referred to last week has now given rise to a reasonable amount of business which in turn has caused the prices to strengthen, especially in the cases of copper and zinc. It is noteworthy that the major part of the rise in the copper price took place whilst the engineering and shipbuilding strikes were on in the U.K. and many people consider that this is a sign for a continuing good market.

COPPER FIRMER

The copper market has been very active and firm with reports of business from a number of consuming countries, although the volume is still far from satisfactory and with the Easter holidays approaching there may be another lull in which case a slight recession in the price level cannot be ruled out. However the general opinion is that quotations are likely to advance to a little above the £250 per ton mark. The rise has been helped first by the expectation of an end of the strikes in the U.K. and subsequently by this happening, and also by news of strikes in copper-producing countries.

The strike at El Teniente continues and at the end of the third day more than 1,000 tons of refined copper had been lost.

The threatened strike at Noranda has still not taken place and the continued postponement of its commencement seems to indicate that there are now better hopes for expecting a settlement. In Rhodesia there was an unexpected strike of the Mufulira mine which commenced on Monday when the European daily paid workers ceased to work and have since continued on strike against the advice of the union.

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The contango on the London Metal Exchange continues in spite of a reduction in warehouse stocks by 137 tons to 3,722 tons.

★

In the States, business has been better with export orders being booked up to 31 c. and customs smelters being able to sell reasonable tonnages at between 31½ c. and 32 c. per lb. In sympathy with this higher price, scrap prices have increased but there is still little sign of any large tonnages coming on to the market. In February, copper consumption in the States is estimated at 114,341 short tons against 119,517 short tons in January, with fabricators stocks being down to 13,400 short tons.

It is reported that sales of copper and brass-fabricated products during 1956 were some 12½ per cent lower than the tonnage for 1955 but that during this year trade has been maintained at the lower level. In view of the different estimates which have appeared in various publications as to the tonnage that the U.S. government would have to absorb in the event of a steep fall in the copper price, the U.S. Commerce Department announced that the intake of copper under the Defence Production Act would be about 4,000 s.tons a month if the price fell below 29 c. per lb. and 10,000 short tons a month if the price fell below 27 c. per lb.

These figures are very much lower than some which have been published and the difference is probably due either to the fact that the higher figures might have been based on the total number of projects covered and ignoring the fact that a number of contracts have already terminated, or, by counting in or leaving out some contracts providing for purchase at the option of the government, or others at the option, of the contractor: all that can be said for certain is that the committed Government intake, if the price falls, is of sufficient size to be a market factor.

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The president of the Anaconda Copper Co. at the end of a trip in Chile said that with the developments now taking place, the present output of 27,000 s.tons a month from Potrerillos and Chuquicamata will be raised by about 6,000 s.tons a month by 1959.

★

In Rhodesia, Sir Ernest Oppenheimer, when speaking about the recent fluctuations in the copper price, stated that he considered the ups and downs could be obviated by improved selling technique, and this has given rise to some speculation as to whether he was hinting at the possibility of there being some loose agreement being reached either between the major copper producers to limit production in times of falling prices, or to withhold metal from the market. The copper production of Northern Rhodesia for 1956 is now given as electrolytic copper 225,953 l.tons; blister copper 157,531 l.tons.

BUFFER STOCK MANAGER COULD NOW BUY

After the initial rise in the tin price following the announcement of the International Tin Council's alteration in prices the market has sunk back and is now within the range at which the buffer stock manager could operate, but the majority opinion is that he is unlikely to, so near to the top of the limited range. The demand has been a little better and it is expected that there will be little variation in the general price level before Easter. The backwardation has decreased slightly in spite of a fall in stocks of 143 tons to 559 tons.

During March, shipments from Singapore amounted to 3,030 l.tons and from Penang to 4,659 l.tons. The International Tin Study Group give the January production of tin in concentrates as 14,300 tons against 15,200 tons in December and of tin metal as 15,500 tons against 14,800 tons. The world tin plate production in January amounted to 758,000 tons against 527,000 tons. The 1956 consumption of tin metal excluding the U.S.S.R. amounted to some 160,000 tons which is a continuation of the small but steady rise in consumption shown over the last few years. On Thursday morning the Eastern price was equivalent to £784¼ per ton c.i.f. Europe.

LEAD FEATURELESS — ZINC ACTIVE

The lead market has again been featureless, with consumption remaining at a medium level throughout the world. In February, the output in the United States was 47,912 s.tons against 50,854 s.tons in January, whilst shipments to consumers amounted to 40,549 s.tons against 37,517 s.tons. The production in the O.E.E.C. countries for the same period amounted to 48,042 metric tons as opposed to 52,069 tons in January. In Northern Rhodesia the 1956 production was 15,200 l.tons.

The zinc market has been very much more active with rising prices due largely to an increased demand for nearby metal, probably needed against barter transactions. This has resulted in an increase in backwardation on the L.M.E. to over £3 per ton. Demand for both high grade and ordinary quality zinc remains good and it is hoped that there will be an increase in automobile production in the U.S. during this month with a resulting better demand for high grade metal. In the U.K. it is considered that the recent strikes will not affect the consumption of zinc to any large extent. In Northern Rhodesia the 1956 production was 28,925 l.tons.

Closing prices and turnovers are given in the following table:—

LONDON METAL AND ORE PRICES, APRIL 4, 1957

THE WEEK ON THE L.M.E

	March 28 Buyers	March 28 Sellers	April 4 Buyers	April 4 Sellers
COPPER				
Cash	£239½	£239¾	£244	£244½
Three months	£240	£240½	£244½	£244¾
Settlement		£239¾		£244½
Week's turnover	5,325 tons		7,750 tons	
LEAD				
Current ½ month	£112½	£112⅝	£112½	£113
Three months	£111½	£112	£112	£112½
Week's turnover	3,200 tons		3,350 tons	
TIN				
Cash	£780	£782	£772	£774
Three months	£769	£769½	£763	£764
Settlement		£782		£774
Week's turnover	1,005 tons		620 tons	
ZINC				
Current ½ month	£96½	£96¾	£98½	£98¾
Three months	£94½	£94¾	£95	£95¼
Week's turnover	2,975 tons		6,500 tons	

METAL PRICES

Aluminium, 99.5%, £197 per ton

Antimony —
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton

Bismuth (min. 1 ton lots) 16s. lb. nom.

Cadmium 12s. 0d. lb.

Cerium (99% nett), £13 18s. lb. delivered U.K.

Chromium, 7s. 2d. lb.

Cobalt, 16s.-19s. lb.

Germanium, 99.99%, Ge. kilo lots 3s. 4d. per gram

Gold, 250s. 6d.

Iridium, £27/29 oz. nom.

Lanthanum (98/99%) 15s. per gram

Manganese Metal (96%-98%) £310

Magnesium, 2s. 5½d. lb.

Nickel, 99.5% (home trade) £600 per ton

Osmium, £20/22 oz. nom.

Osmiridium, nom.

Palladium, £8 0s./£8 10s. oz.

Platinum U.K. and Empire Refined £33/£33½ oz
Imported £33½/£33¾ nom.

Quicksilver, £86 ex-warehouse

Rhodium, £42 oz.

Ruthenium, £15/£17 oz. nom.

Selenium, 85s. nom. per lb.

Silver, 79½d. f. oz. spot and 79½ f'd.

Tellurium, 15s./16s. lb.

ORES AND OXIDES

Bismuth .. 65% 8s. 6d. lb. c.i.f.
20% 3s. 3d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (semifriable) 48% .. £17 8s. 0d. per ton c.i.f.
" Hard Lumpy (45%) .. £17 8s. 0d. per ton c.i.f.
" Refractory 40% .. £12 15s. 0d. per ton c.i.f.
" Smalls 42% .. £16 5s. 0d. per ton c.i.f.
Baluchistan .. £18 15s. 0d. per ton c.i.f.

Columbite, 65% combined oxides, high grade .. 185s /197s. 6d. per unit

Fluorspar—
Acid Grade, Flotated Material .. £22 13s. 3d. per ton ex. works
Metallurgical (75/80% Ca F_2) .. 156s. 0d. ex. works

Lithium Ore—
Petalite min. 3½% Li_2O .. £8-£10 per ton f.o.b. Beira
Lepidolite min. 3½% Li_2O .. £8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li_2O .. £28-£32 per ton f.o.b. Beira

Magnesite, ground calcined .. £28 0s./£30 0s. d/d
Magnesite Raw (ground) .. £21 0s./£22 0s. d/d
Molybdenite (85% basis) .. 8s. 5d. nom. per lb. (f.o.b.)

Titanium Ore —
Rutile 95/97% TiO_2 .. £64/£65 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2 .. £11 per ton c.i.f. Malayan

Wolfram and Scheelite (65%) .. 160s./165s. 0d. per unit c.i.f.

Manganese Ore Indian
Europe (46%-48%) basis 165s. freight plus 17½% surcharge .. 145d. nom. per unit c.i.f.
Manganese Ore (43%-45%) .. 116d. nom. per unit. c.i.f.
Manganese Ore (38%-40%) .. 111d. nom. per unit. (including duty)

Vanadium —
Fused oxide 90-95% V_2O_5) .. £12½-£13½ per unit c.i.f.
Zircon Sand (Australian) (65-66% ZrO_2) .. £20 per ton c.i.f.

LONDON STOCK EXCHANGE PRICES, APRIL 3, 1957

Finance	Price Apr. 3	+ or — on week
African & European	55/-	.....
Anglo American Corpn.	6½	+⅛
Anglo-French	21/3	.....
Anglo-Transvaal Cons.	26/3	.....
Central Mining (£1 shrs)	56/-	—1/6
Consolidated G'fields	56/-	.....
Consol. Mines Selection	27/9	+6d
East Rand Consols	1/4½	.....
General Mining	62/6	.....
H. E. Prop.	8/-	.....
Johnnies	39/9	.....
Rand Mines	63/9	—1/3
Rand Selection	34/4½	+1/3
Union Corporation	36/1½	+1½d
Vereeniging Estates	5⅛	—⅛
Writs	34/9	+3d
West Wits.	32/6	.....
Rand Gold		
Blyvoors	19/6	+6d
Brakpan	5/4½	.....
Buffelsfontein	31/7½	.....
City Deep	12/4½	+3d
Consol. Main Reef	12/1½	—3d
Crown	26/3	—6d
Daggas	30/3	+3d
Dominion Reefs	17/6	—3d
Doornfontein	20/9	.....
Durban Deep	21/1½	—7½d
E. Champs	2/9	—3d
E. Daggas	7/9	.....
E. Geduld (4s. units)	27/3	+3d
E. Rand Props.	41/3	+9d
Geduld	68/9	+1/3
Govt. Areas	3/3	+3d
Grootvlei	16/4½	.....
Hartebeestfontein	47/4½	+1/-
Libanon	6/3	.....
Luipaards Vlei	13/3	.....
Marievale	16/7½	.....
New Kleinfontein	3/3	—1½d
New Pioneer	18/9	—1½d
Randfontein	30/6	+3d
Robinson Deep	6/6	—3d
Rose Deep	8/-	.....
Simmer & Jack	3/7½	—1½d
S.A. Lands	20/6	—3d
Springs	2/-	.....
Stilfontein	25/7½	+4½d
Sub Nigel	17/1½	—4½d
Vaal Reefs	30/9	+10½d
Van Dyk	2/10½	+7½d
Venterspost	12/-	+3d
Vlakfontein	14/3	+3d
Vogelstruisbult	12/6	.....
West Driefontein	4½	—⅛

Rand Gold contd.	Price Apr. 3	+ or — on week
W. Rand Consolidated	30/-	.....
Western Reefs	27/1½	—1½d
O.F.S. Gold		
Freddies	5/3	.....
Freedies Consolidated	3/-	.....
F.S. Geduld	64/4½	—1/3
Geoffries	2/10½	.....
Harmony	20/6	.....
Loraine	3/9	—3d
Lydenburg Estates	12/3	+3d
Meyriespruit	4/1½	—1½d
Midale Wits	8/-	+3d
Ofsits	49/6	+1/-
President Brand	48/9	—7½d
President Steyn	26/-	—1/3
St. Helena	24/3	—3d
Virginia Ord.	9/4½	+4½d
Welkom	13/3	—1½d
Western Holdings	64/4½	+1/10½
West African Gold		
Amalgamated Banket	1/3	.....
Ariston	4/3	.....
Ashanti	17/-	+1/1½
Bibiani	2/1½	.....
Bremang	1/4½	.....
Ghana M.R.	1/7½	.....
Konongo	1/5½	+½d
Marlu	½d	.....
Taquah	1/-	—1½d
Western Selection	5/9	+3d
Australian Gold		
Gold Mines of Kalgoorlie	13/-	—9d
Great Boulder Prop.	12/9	+3d
Lake View & Star	18/6	—3d
Mount Morgan	14/3	+6d
North Kalgurli	7/-	—1½d
Sons of Gwalia	1/9	—1½d
Western Mining	9/9	.....
Miscellaneous Gold		
Cam & Motor	7/7½	.....
Champion Reef	14/9	+6d
Falcon Mines	7/4½	—1½d
Globe & Phoenix	22/6	—6d
Motapa	10½d	.....
Mysore	3/9	.....
Nundydroog	20/3	+6d
St. John d'el Rey	50/-	+5/-
Zams	50/-	.....

Diamonds and Platinum	Price Apr. 3	+ or — on week
Anglo American Inv.	8½	+½
Casts.	24/7½	.....
Cons. Diam. of S.W.A.	10/9	.....
De Beers Defd. Regd.	4½	+⅛
De Beers Pfd. Regd.	13½	—½
Pots. Platinum	14/7½	—4½d
Waterval	24/3	+3d
Copper		
Bancroft	41/-	+3d
Chartered	72/3	+3/3
Esperanza	2/7½	—1½d
Magundi	9/3	.....
Messina	8⅝	+⅛
Nchanga	12⅞	+½
Rhod. Anglo-American	4½	+⅛
Rhod. Katanga	37/3	+1/-
Rhodesian Selection	22/6	+6d
Rhokana	38½	+1½
Rio Tinto	4½	+⅛
Roan Antelope	12/7½	+4½d
Selection Trust	4½	+⅛
Tanks	7½	+½
Tharsis Sulphur Br.	4½	+¼
Tin (Eastern)		
Ayer Hitam	26/-	—3d
Gopeng	15/4½	+3d
Hongkong	6/10½	.....
Ipoh	17/9	.....
Kamunting	10/6	+1½d
Kepong Dredging	5/3	.....
Kinta Tin Mines	23/-	+6d
Malayan Dredging	14/10½	.....
Pahang	14/4½	—6d
Pengkalen	17/9	.....
Petaling	6/3	+1½d
Rambutan	18/9	.....
Siamese Tin	13/6	+1½d
Southern Kinta	18/-	.....
S. Malayan	10/3	+1½d
S. Tronoh	7/4½	.....
Sungei Kinta	21/3	—3d
Tekka Taiping	8/9	.....
Tronoh	12/10½	—3d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	9/-	—4½d
Beralt Tin	43/9	—9d
Bisichi	4/3	.....
British Tin Inv.	25/6	+9d
Ex-Lands Nigeria	2/4½	.....
Geevor Tin	20/10½	—3d

Tin (Nigerian and Miscellaneous) contd.	Price Apr. 3	+ or — on week
Gold & Base Metal	1/2½	.....
Jantar Nigeria	3/4½	.....
Jos Tin Area	15/-	.....
Kaduna Prospectors	2/-	.....
Kaduna Syndicate	2/1½	.....
London Tin	11/7½	+7½d
United Tin	1/-	.....
Silver, Lead, Zinc		
Broken Hill South	76/3	+[illegible]
Burma Mines	3/6	—3d
Consol. Zinc	89/3	+3/6
Lake George	10/3	+1½d
Mount Isa	30/6	+1/-
New Broken Hill	54/9	+1/9
North Broken Hill	6	+⅛
Rhodesian Broken Hill	12/6	.....
San Francisco Mines	26/6	+1/6
Uruwira	4/-	.....
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	2⅛	—⅛
Associated Manganese	36/3	+1/-
Cape Asbestos	10/6	—1½d
C.P. Manganese	25/9	+3d
Consol. Murchison	50/-	—1/3
Natal Navigation	3⅛	+⅛
Turner & Newall	120/3	+2/9
Wankie	19/3	+9d
Witbank Colliery	5½XD	.....
Canadian Mines		
Dome	$25¾	.....
Hollinger	$50½	+½
Hudson Bay Mining	$166	+7
International Nickel	$203½	+1
Mining Corpn. of Canada	£6½	.....
Noranda	$99	+2
Quemont	£6½	+½
Yukon	4/7½	+1½d
Oil		
Apex	44/9	+4/-
Attock	37/9	.....
British Petroleum	152/-	+1/-
Burmah	104/9	+6/-
Canadian Eagle	70/9	+4/9
Mexican Eagle	21/10½	.....
Shell	180/6	+1/1½
T.P.D.	67/-	+7/-
Ultramar	74/6	+3/1½

Mining Finance

Chartered at the Half-way Mark

The most important near-term point for stockholders in the British South Africa Company (Chartered) made by the president, Mr. C. Hely-Hutchinson, in his speech at the recent meeting was his forecast of 1956-57 earnings.

He looks for a drop in taxed profits for the year to September 30 next to the neighbourhood of £4,500,000, a fall of £2,500,000 compared with those for 1955-56. Mr. Hely-Hutchinson is to be congratulated on his frankness at this half-way stage in the company's year.

The forecast takes into account the lower dividend income that must be expected from Chartered's copper shareholdings. It is also based on the important assumption that the copper price will remain at about its present level of £240 per ton for the next six months. If it does, the 1956-57 average on which the company's royalty revenue will be based will be about £225 per ton against £316 last year. The president has also assumed a higher rate of metal production in Northern Rhodesia as a result of the bringing into production of the Bancroft and Chibuluma mines.

Two factors may confound his hopes to some extent in this respect. Firstly, the water troubles at Bancroft may slash this mine's initial production target for 1957 of 42,800 tons by as much as half. Secondly, and rather less certainly, there is persistent talk from Rhodesia of a possible production cutback until the copper price improves again. Mr. Hely-Hutchinson may even have had this latter possibility in mind himself when he referred to the point "at which producers may be moved to take active steps to create conditions favourable to maintaining or even improving the current price level".

For the more distant future the president refers once again to Chartered's policy of building up its investment portfolio against the day thirty years' hence when its mineral royalty rights will be handed over to the Northern Rhodesian government. One of the tricky points in this connection is to maintain a proper balance between the allocation of profits for this future purpose and the payment of current dividends. Stockholders who are not very much concerned with 1986 will probably look wryly on Mr. Hely-Hutchinson's indication that "the crippling effect of the tax on distributed profits" is a factor encouraging the present retention of a substantial part of the earnings for investment.

Shareholders in the Rhodesia Railways Trust should note that the Chartered president sets out a very good case why they should accept the offer of 60s. per share for the balance of the Trust's capital not already held by Chartered. They have until April 15 to accept the offer. Chartered's present holding is 81 per cent of the capital.

ST. HELENA'S GOOD MONTHLY REPORT

Working profits of South African gold producers for March were based on a gold price of 249s. 5d. per ounce compared with 248s. 9d. in February. Our usual cumulative and comparative table will be found on page 437 of this issue.

Amongst reports from O.F.S. producers, that in respect of St. Helena commands particular attention. During March this property managed to step up its throughput by as much as 10,000 tons to 120,000 tons which had the effect of lowering costs still further to 40s. 5d. and boosting profits to £192,765 from £177,352. In view of the very much greater tonnage milled it is most satisfactory that grade should have been maintained at virtually the same level as that of the previous month.

Development at St. Helena over the past three years has been remarkably consistent at around 400 in. dwt. and an ore reserve of 3,250,000 tons at 6.1 dwt. has already been established. Although the company must face considerable capital expenditure for the next two or three years, the future is one of considerable promise. Indeed, at the present level of 120,000 tons monthly St. Helena is not far off its milling target of 1,800,000 tons yearly, and it should not, therefore, be long before earnings achieve their envisaged potential.

Costs at the property are by far the lowest in the O.F.S., and prospects for a rising distribution as capital expenditure tails off are good. On its latest dividends totalling 1s. 4d. St. Helena's 10s. shares yield over 5½ per cent at their present price of around 23s. x.d. and are thus in a position to pay for their keep until the property's full maturity.

At Welkom, milling expanded by 2,000 tons and profits by some £6,000. A striking advance in throughput was also achieved at Western Holdings which milled 6,000 tons more and increased its profits by £20,000. An excellent report came from Blyvoor which crushed 11,000 tons more and increased working profits by as much as £57,000 to £459,000. Hartebeestfontein milled 5,000 tons more than in the previous month and raised its working profits from gold and uranium to nearly £477,000 from around £425,000.

AUSTRALIA'S MARGINAL GOLD MINES

In Western Australia the question is being considered as to whether any attempt should be made to save marginal gold mines in the State by subsidies on production, by loans, or by reduced freights. Of course, from the government and tax payers' point of view, uneconomic mines cannot expect to receive indefinite help. Yet it might well be argued that the industry has met rising costs and a fixed price for gold very creditably, and, in view of its great importance to international currency and exchange, deserves every assistance. The essential need is to keep mines in a condition to take immediate advantage of any increase in the price of gold, which would enable large reserves of marginal or low-grade ore to be turned to profitable account. There seems, in fact, to be every justification for continuing what assistance is at present given to the industry, and in addition for conceding a much greater measure of support generally. What is needed is the provision of a bounty that will not merely maintain production, but also increase it, and stimulate the search for more gold deposits.

JOHNNIE'S GROUP IN 1956

The Annual report of Freddies Consolidated states that during the current year the efforts to be made to increase the rate of stoping should bring about a reduction of current losses to minor proportions. Consideration would be given to increasing the rate of exploration development with a view to determining the value of the ore in the remaining claim area. Until current losses had been reduced, however, additional development was not advisable, as it would only encroach upon the company's financial resources.

The annual report of the Randfontein Estates and Gold Mining points out that although the company has not been liable for taxation on mining income during the period 1953 to 1956, the virtual completion of its uranium programme and the absence of any further large capital expenditure will bring about a decrease in redemption allowances which, in consequence, will entail a larger tax liability. Profitability of gold mining operations is expected to decline, but this should be compensated by additional earnings from uranium.

For administrative reasons it has been decided to change the financial year end

RECENT INTERIM DIVIDEND ANNOUNCEMENTS

Company	Year ending	Dividends latest %	Dividends corresponding %	Date Payable	Total last year %
Mount Lyell (*a*)	30.9.57	2½	5	May 14	12.083
Pahang Cons...	31.7.57	10	10	May 18	50
Perak River Hydro.	31.7.57	4	4	May 16	10
Renong Tin (*b*)	30.6.57	25	15	May 15	45

(*a*) For nine months.
(*b*) On smaller capital after repayment

of Free State Development and Investment Corporation from March 31 to June 30. Accordingly, the impending report and accounts will cover a period of fifteen months instead of the customary twelve. Government Gold Mining Areas (Modderfontein) Consolidated has given three months' notice to the South African Minister of Mines to discontinue its gold mining operations. The company has sufficient tonnages of accumulated slimes to maintain production of pyrite, which will, therefore, not be curtailed as a result of the closure decision.

ASHANTI MILL 17.6 DWT.

In his statement to shareholders of Ashanti Goldfields Corporation, Major-General Sir Edward Spears, said that reorganisations at the property had reached a stage at which—unless the unforeseen occurred—a high level of ore output at not less than 17.6 dwt. of gold per ton might be expected. From October to March the company had milled a record of 164,900 tons yielding 133,309 oz. of gold and earning a working profit of £654,342. Results for the second half of the year should at least equal these figures.

Major-General Spears, having just returned from a visit to Ghana, was able to express confidence in the political outlook for the country. He quoted extracts from speeches by the Prime Minister, Dr. N. Nkrumah, and Mr. Gebedemah, the Finance Minister, which revealed an anxiety to make sure that no unnecessary hinderances were placed in the way of foreign investment.

Rand & Orange Free State Returns for March

Company	March 1957 Tons (000)	Yield (oz.)	Profit† (£000)	Year ends	Current Financial Year Total to date Tons (000)	Yield (oz.)	Profit† (£000)	Last Financial Year Total to date Tons (000)	Yield (oz.)	Profit† (£000)
Goldfields										
Doornfontein *a*	80	32,800	172·1	J	685	273,930	1305·4	470	189,632	748·8
Libanon	102	22,870	57·0	J	876	196,536	493·3	874	191,191	506·5
Luipaards Vlei *b*	80	14,252	16·2	J	732	131,169	93·7	—	—	—
Rietfontein	24	5,645	16·2	D	75	17,049	48·1	78	17,655	55·0
Robinson	74	14,741	8·2	D	218	43,725	17·6	234	51,254	31·3
Simmer & Jack	95	17,533	19·6	D	283	51,997	52·0	303	52,935	42·3
Sub Nigel	66	17,257	29·3	J	594	166,577	415·4	596	186,404	685·4
Venterspost	125	29,600	64·8	J	1,112	254,438	591·0	1,084	256,791	666·0
Vlakfontein	50	17,713	86·5	D	144	51,768	250·5	116	42,773	210·4
Vogels *a*	100	23,200	66·8	D	298	69,485	184·7	303	77,044	187·6
West Drie *a*	75	71,110	585·9	J	675	633,495	5210·5	639	519,173	4137·9
Anglo American										
Brakpan	109	18,560	14·2	D	317	54,129	34·0	319	54,400	42·6
Daggas *a*	223	49,394	270·8	D	653	145,208	789·8	616	140,610	795·4
East Daggas	94	15,594	33·4	D	280	46,195	96·0	284	46,965	106·9
F.S. Geduld *a c*	52	28,257	150·1	S	288	144,570	691·1	104	35,093	76·9
Loraine *a*	63	12,156	L5·6	S	367	70,296	L41·8	347	57,589	L211·6
President Brand *a*	61	46,715	383·0	S	362	278,123	2289·5	314	251,178	2078·2
President Steyn *a*	89	34,734	195·0	S	532	206,792	1195·4	500	181,941	1015·3
S.A. Lands	88	19,184	65·5	D	258	56,795	195·4	257	50,755	146·0
Springs	125	13,430	4·8	D	372	41,625	18·0	376	46,164	38·9
Vaal Reefs *a d*	57	24,970	147·0	D	167	72,235	419·5	—	—	—
Welkom *a*	87	22,318	51·0	S	514	128,452	278·9	492	103,476	122·6
Western Holdings	95	45,634	286·9	S	536	244,542	1564·7	448	171,755	1014·4
West Reef Ex.	123	26,420	64·7	D	362	77,900	184·1	350	68,954	145·3
Central Mining										
Blyvoor *a*	110	62,811	459·2	J	946	534,060	3888·9	939	531,459	3861·4
City Deep	151	29,596	20·2	D	448	87,760	55·8	433	84,268	8·3
Cons. M.R.	173	23,504	9·0	J	1,477	206,397	80·4	1,523	216,572	146·9
Crown	248	35,222	L6·4	D	731	105,971	L20·4	844	135,183	110·5
D. Roodepoort	189	33,151	56·6	D	547	95,793	157·8	528	90,287	147·4
East Rand Prop.	216	56,424	166·6	D	622	163,694	267·8	617	160,420	528·1
Harmony *a*	83	31,973	157·7	J	701	243,966	1414·5	659	251,567	1281·0
Modder East	144	14,552	5·0	J	1,248	128,407	16·0	1,165	123,049	61·9
Rose Deep	51	7,738	0·3	D	146	22,592	0·6	134	22,248	6·7
J.C.I.*										
E. Champ d'Or *a*	12	320	L24·8	D	35	961	L74·2	50	2,939	5·0
Freddies Cons. *a*	58	13,817	L25·0	D	165	40,565	L80·5	198	35,875	L147·2
Govt. G.M.A. *a*	144	21,284	L16·5	D	428	64,969	L70·1	697	89,922	16·0
Randfontein *b*	89	13,932	15·1	D	246	41,395	68·4	—	—	—
Union										
East Geduld	140	43,057	303·6	D	408	125,656	877·7	416	129,188	915·9
Geduld Prop.	104	16,506	27·8	D	309	48,988	79·2	19	45,091	109·2
Grootvlei	195	41,736	220·0	D	572	122,542	641·7	565	122,309	668·3
Marievale	72	18,902	85·1	D	211	55,490	248·0	208	54,439	249·8
St. Helena	120	34,803	192·8	D	350	102,042	560·6	278	84,478	453·1
Van Dyk	79	13,024	3·6	D	233	38,395	8·9	317	46,173	37·0
General Mining										
Buffelsfontein *a c*	94	27,980	104·8	J	261	73,205	247·3	—	—	—
Ellaton *a*	33	6,973	18·0	D	96	20,279	47·3	94	22,730	94·3
S. Roodepoort	29	6,780	24·7	J	260	60,726	211·4	248	56,362	200·1
Stilfontein *a*	96	40,800	250·7	D	280	118,994	736·7	257	100,973	596·8
W. Rand Cons. *b*	156	21,423	24·2	D	428	59,169	33·8	—	—	—
Anglo-Transvaal										
Hartebeestfontein *a*	85	45,475	291·8	J	760	334,853	2041·5	463	203,173	1016·3
N. Klerksdorp *a*	11	1,308	L5·0	D	31	3,719	L15·4	32	3,926	L11·1
Rand Leases	172	26,918	9·3	J	1,420	220,992	L169·0	1,583	252,772	217·5
Village M.R.	33	5,585	8·0	J	297	47,337	75·3	326	45,304	84·2
Virginia O.F.S. *a*	98	26,460	74·0	J	829	187,615	533·1	647	139,015	287·7
Others										
N. Kleinfontein	101	11,873	L2·4	D	291	33,473	L31·7	313	36,811	10·0
Wit Nigel	18	3,995	7·2	J	162	31,886	70·2	165	34,699	71·2

Gold has been valued at 249/5d. (February 248/9d.) per oz. fine. L indicates loss. † Working Profit. * Working Profit includes sundry revenue. *a* Excluding revenue from Uranium, Acid and Pyrite. *(b)* Gold Division only. *c* Production began January 1956. *d* Production began May 1956. *e* Production began January 1957. Operations at Merriespruit remain suspended.

GOLDS RECOVER

After falling to a new all-time low of 67.7 the *Financial Times Gold Share Index* later recovered to 69.3. This was largely due to a better feeling regarding the "hedge" attractions of gold shares.

Market conditions on both sides of the Atlantic during the past week were better. President Eisenhower's expressed wish to cut income-tax during his term was, naturally, well received, while, in London, the resumption of work in the shipbuilding and engineering industries pending Courts of Enquiry, favourably assisted sentiment.

Index	*March 28*	*April 3*
Dow Jones Index	475.01	478.31
F. T. Ordinary	191.3	194.0
F.T. Gold	68.1	69.3

Coppers went better on the higher metal price and Chartered attracted investment buying. After a sharp decline to around 32s. Rho-Kats recovered sharply in front of the annual report. Diamonds were weak, but platinums and tins were largely unchanged. Australian lead-zincs all made gains on the week.

IAN MOSELEY LEAVES "M.J."

Mr. Ian Moseley, Financial Editor of *The Mining Journal*, relinquishes this appointment to-day to join Investment Registry Ltd.—an investment and issuing house. Our best wishes go with him for success in his new appointment, in which he will find himself in not unfamiliar surroundings; as before joining the *Mining Journal* in 1953 he was with Minerals Separation Ltd.

Our Joint Editor, Mr. R. Bruce Dunfield, will in future concern himself more closely with the general conduct of our financial columns.

The Stock Exchange Official Year Book.—Volume I for 1957 is now available from Thomas Skinner and Company (Publishers) Ltd., Gresham House, Old Broad Street, London, E.C.2. The price for this work, together with Volume II due to be published in September, is £8 net, or by post, inland/overseas, £8 5s.

Owing to the rapidly increasing size of Volume II, the "Mines" section has now been transferred to Volume I which comprises some 1,950 pages and includes the fullest information on the securities of government, municipalities, other corporate bodies and the nationalized industries. The "Companies" section includes about 3,600 notices of every category except "Commercial and Industrial" which are to be found in Volume II. As usual, this valuable reference book contains lists of broker members of the London Stock Exchange, and members of the Associated and Provincial Stock Exchanges.

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ASHANTI GOLDFIELDS CORPORATION

ENCOURAGING PROSPECTS FOR FUTURE DEVELOPMENT

The 60th annual general meeting of Ashanti Goldfields Corporation Limited was held on April 3 in London.

Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D. (Chairman and Managing Director), presided and, in the course of his speech, said:

The reduced profits for the year under review are due to the 14 weeks' general strike on the mines from November 20 to February 27. In the current year, the re-equipment of your property, and the improvements to the shaft system and underground lay-out, on which such large sums have been spent, has reached a stage when we can, unless the unforeseen occurs, look forward with confidence to obtaining a high level of output of ore of not less than 17.6 dwt.

It was our intention to produce about 22,000 ounces a month from 28,000 tons, but for the first six months of the current year, this estimate was exceeded by 1,300 ounces.

From October to March, the record tonnage of 164,900 was produced, yielding 133,309 ounces of gold. Working profit was £654,342. If our expectations are fulfilled the results for the second half year should at least equal these figures, and will constitute the second largest output of gold in any year in the history of Ashanti Mine.

The technical position of the mine continues to be strong. Reserves are sufficient for 5 to 6 years' supplies to the mill, and prospects for future development are encouraging.

As regards future dividends, you may rest assured that it will be our policy to relate these to the improved profits which we hope to achieve, while making adequate provision for the necessary expenditure to ensure the future of the property.

Referring to the Committee of Inquiry into the mining industry which had been set up by the Government, and which held its sessions during the strike, the Chairman said: Its report fully justifies the case put forward by the gold mining companies through the Chamber of Mines, that the industry could not afford the wage increases demanded by the Union.

Promises of assistance from the Government enabled the Chamber to reach a settlement with the Union in September giving wage increases of between 10% and 12½% back dated to June 1, 1956. Since then relations with the Union have been excellent.

Metallurgical

The elimination of a bottleneck in the roasting section that had existed since the plant was first commissioned in 1947, has enabled the monthly milling rate to be increased by 2,000 tons to 28,500 tons per month. Since October last year the plant has operated continuously throughout the month with no shut-down at month end to work off accumulated concentrates. It is not necessary to emphasize the importance of this increased plant capacity on a high grade mine such as Ashanti.

The report and accounts were adopted.

BIBIANI (1927) LIMITED

SATISFACTORY RECOVERY IN PROFITS

The thirtieth annual general meeting of Bibiani (1927) Limited was held on April 3 in London.

Major-General Sir Edward L. Spears, Bart., K.B.E., C.B., M.C., F.Inst.D. (Chairman and Managing Director) presided, and, in the course of his speech, said:

Bibiani was particularly severely affected by the 14 weeks' general strike on the mine from November 20, 1955 to February 27, 1956. Not only did the year's operations result in a small loss, which makes it impossible to recommend the payment of a dividend for the year ended September 30 last, but the development programme was inevitably delayed.

On the other hand, the recovery in working profits since the strike has been satisfactory. There is no reason that we can foresee why the payment of dividends commensurate with earnings should not be resumed this year. But working profit will be considerably less than in the year before the strike, since we shall be spending much more on development. For the first six months of the current year working profit is £51,800. This compares with £85,734 for the same period in the year preceding the strike.

As regards longer-term prospects, I had hoped that by now we should have more definite information, but results to date are inconclusive. Much will depend on the tonnage and grade of ore developed in the next eighteen months.

The Board of Inquiry into the mining industry set up by the Government presented its report in June, 1956. This report fully justified the case put forward by the Chamber of Mines that unless they received assistance, the poorer Mines could not afford wage increases.

In consequence, the Government agreed to make a grant of £100,000 a year for two years to be distributed amongst the less prosperous mines.

Bibiani's share of this for the period June 1 to September 30 1956 was £10,159, which helped to reduce the loss of profit due to the strike.

In September, agreement was reached with the Mines Employees Union for an increase in wages of between 10 and 12½%.

Output

Output for the year was 259,235 tons milled yielding 57,382 fine ounces of gold at an average grade of 4.8 dwts/ton. This was 107,344 tons and 18,032 ounces less than last year. However, average grade improved by 0.4 dwts/ton.

For the first six months of the current year a monthly milling rate of 30,000 tons has been maintained and gold recovery has been steady at 6,500 ounces per month. We plan to maintain this monthly output for the rest of the year.

I was at the mine in February of this year. I visited every department, including underground, and was well pleased with all I saw. I do not believe there is in West Africa a more efficiently run Mine than Bibiani.

I was particularly pleased to see how good the relations are between Africans and Europeans, and the active part Bibiani plays in the life of the local community. Considerable progress is being made in Africanization.

The report and accounts were adopted.

WIGAN AND DISTRICT MINING AND TECHNICAL COLLEGE

Applications are invited for the post of Head of the Mining and Geology Department.

Candidates should possess high academic qualifications, preferably an Honours Degree in Mining, practical mining experience, and teaching experience, preferably in a Technical College or University.

Salary in accordance with Burnham scale for Heads of Departments Grade V (£1,900-£50-£2,050).

Further particulars and application form will be sent by the undersigned. Last date for receipt of applications: Friday, April 12, 1957.

E. C. SMITH,
March 22, 1957. Principal.

MOUNT ISA MINES LIMITED
QUEENSLAND, AUSTRALIA

VACANCIES FOR GEOLOGISTS

Qualifications: University Degree in Science with geology a major subject or equivalent School of Mines or Technical College Diploma.

Duties: This company is expanding its Geological Department to meet the demands of an expanding production programme and increased exploration in areas outside Mount Isa. Graduates are required for geological mapping, core logging, proposing exploration, ore reserve estimation.

Salary: Minimum £A1,200 per annum dependent upon qualifications and experience. In addition to salary, successful applicants will receive a variable Lead Bonus at present (March, 1957) £A10 10s. per week.

Applications: To the London Secretary, Adelaide House, King William Street, London, E.C.4, stating age, marital status and details of qualifications and experience. No closing date for applications.

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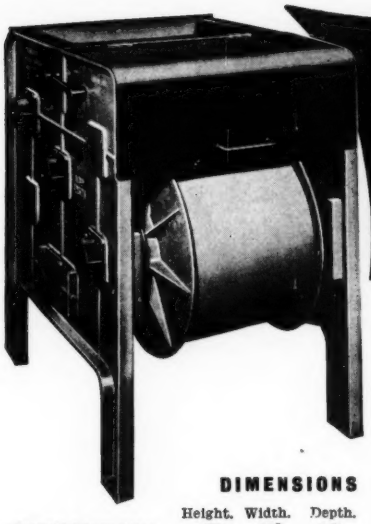
The statement made by the president of The British South Africa Company at the company's fifty-ninth annual meeting appears on page 440.



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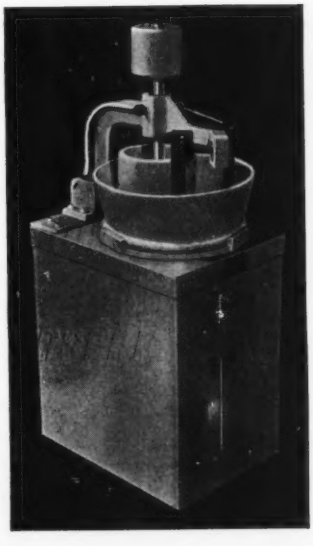

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The mortars and pestles are interchangeable. A ceramic set can be used to process material adversely affected by contact with metal and a metal set, either high grade cast iron or stainless iron can be carried as spare set for use on material for which ceramic is unsuitable.

The pestles are arranged to swing clear of or lift out of the mortars to facilitate emptying and cleaning.

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THE BRITISH SOUTH AFRICA COMPANY

A VERY FAVOURABLE RESULT

SUBSTANTIAL PARTICIPATION IN FEDERATION'S DEVELOPMENT

MR. C. HELY-HUTCHINSON ON COPPER PRICES AND THE OUTLOOK

The 59th annual meeting of The British South Africa Company was held on March 28 at the Chartered Insurance Institute, 20, Aldermanbury, London, E.C.2. **Mr. C. Hely-Hutchinson** (the President) presiding.

The President said:

Board and Management

We are glad to welcome the presence on this side of the table of Mr. H. St. L. Grenfell who, after 19 years' association with the Company (which included a period of six years during which he served with distinction in the Army during the last war) joined the Board last November and has been appointed a member of the Executive Committee in London. For the last 11 years he has been responsible to the resident director in Rhodesia for the Company's business in Northern Rhodesia and brings to his new duties in London a valuable equipment of up-to-date knowledge of that business and an intimate acquaintance with the various people who are responsible for the conduct of the business and administrative affairs of that territory. He is a grandson of Earl Grey who was one of the original directors of the company.

As a consequence of the recent change of Government in the United Kingdom we have with regret had to accept the resignation from the Board of Mr. Julian Amery, on his appointment as Parliamentary Under Secretary of State and Financial Secretary at the War Office. We admire the readiness with which he and others like him are at all times prepared to respond to the call to serve the country without reckoning the cost to themselves of so doing.

In a few days from now Sir Ellis Robins, who as I told you last year, has looked after the business of the Company in Africa since 1928, and was last year appointed Vice President of the Company will hand over his local responsibilities and join the Board's Executive Committee in London to which his accession will not only be very welcome but owing to his long and intimate association with the Company's affairs will be a source of considerable additional strength to that body. He will return to the United Kingdom after nearly 30 years of close personal touch with currents of life in Rhodesia, during which he has rendered signal service to the Company. He proposes to retain some of his public and business interests there (apart from those which he will continue to have as vice-president of the Company). Both duty and inclination will thus cause him to make frequent visits to the Federation. This cannot fail to be of benefit to the interests of the Company.

The local responsibility for the Company's affairs will, on Sir Ellis Robins's departure, be assumed by Sir Charles Cumings whose appointment as Deputy General Manager in Africa was announced in September 1954.

Sir Charles Cumings was born in Rhodesia 53 years ago and is a Rhodes Scholar. He was called to the Bar in 1927 and was a member of the Sudan Civil Service from 1927 until he resigned from it in 1953 having held successively in that administration the important offices of Advocate-General, Chief Justice, and Legal Secretary to the Sudan Government.

You will wish, I am sure, to send a friendly message of welcome to him and to Lady Cumings, to wish success to him on his accession to his new responsibilities and happiness to them both.

Report and Accounts

First let me express the hope that you like the new form of the report. This is the first time that the cover and the general set up of the report have been changed since the Company was founded —nearly 70 years ago. You will, I hope, find the new type of printing and the arrangement of the accounts more pleasing and clearer to the eye. Although you have already had plenty of opportunity to examine its contents I think it should help you to a proper appreciation of last year's remarkable results and to a balanced view of the Company's current prospects if I should draw your attention to some important aspects of those results as well as to certain contemporary factors which have a bearing on those prospects.

The Company's Revenues

The Profit and Loss Account records that the gross income for the year was £15¼m. This is an improvement upon the comparable figure for the previous year of £2¾m., and of that improvement some £2m. was in respect of Mining Revenue and £¾m. in respect of interest and dividends. The larger receipts from dividends were due in part to larger distributions by Northern Rhodesian Copper Companies. The higher interest rates ruling for short term money which as you can see in the Balance Sheet forms at all times a large part of tne Company's liquid resources accounted to a large extent for the increase in interest receipts.

As to the Mining Revenue you can see that this included royalty upon 368,000 tons of copper which was valued for royalty purposes at an average of £316 a ton. These figures are respectively about 30,000 tons and £30 a ton higher than those for the previous year.

Please bear these figures in mind when, in a minute or two we examine and comment upon the year's Profit.

The Company's Expenses

The total charges, other than taxes amounted to about £¾m., an increase of nearly £.2m. These figures include as you can see net losses on realization of investments £¼m. These losses were almost entirely accounted for by sales of Gilt Edged investments for reinvestment at higher gross redemption yields.

Taxes are recorded at £7¼m. This includes for Profits Tax alone £1¼m. of which nearly £1¼m. was levied, upon the gross amount of the dividend.

The figure for taxes exceeds that for the previous year by £1.3m. There remains a net profit after taxes of nearly £7m. which is an improvement on the comparable figure for the previous year of £1.4m.

Allocation of Profit to Dividend and Reserves

The Report records the manner in which the Directors recommend that the profit for the year ended September 30, 1956, should be allocated. There you can see that out of the nett profit after Tax of £7m. a dividend at the rate of 35% (an increase of 5%) is recommended, absorbing £2.7m., leaving a balance of £4.3m., which when added to the sum of £7.2m. brought forward from last year will increase the unappropriated profit to £11.5m.

Out of this there has been appropriated to General Reserve £9.5m., leaving to be carried forward £2m. The reason for making this appropriation to General Reserve will be made clear by reference to the Balance Sheet which we shall examine in a minute.

The Price of Copper

Let us pause at this point and consider the effect of the course of the price of copper, upon which, as you are aware, the amount of royalty directly depends, on the profits of the current financial year.

I have already drawn your attention to the fact that the average value per ton of copper for royalty purposes during the year under review was £316. That average value resulted from the deduction of 10% from the average of the daily quotations of the price of electrolytic copper by the London Metal Exchange during each month in the course of that year. Thus the average of the London Metal Exchange quotations for the year will have been about £350, and the profit for the year after taxes, as you have just heard, has been £7m.

The London Metal Exchange quotation for a ton of electrolytic copper, which has been following a downward course since the end of that year, is now in the neighbourhood of £240. The value for royalty purposes based upon such a quotation would be £216. Bearing in mind the higher quotations ruling during the early months of the current financial year and if, for the remainder of the year, the quotation should remain at about its present level the average value per ton of copper for royalty purposes for the whole year may prove to be about £225.

On that basis, assuming a normal rate of production of copper and making appropriate provision for the lower rate of royalty per ton applicable in those circumstances and for a reduced income from dividends from shares in copper producing companies the profit, after taxes, for the whole of the current financial year would be in the neighbourhood of £4¼m.—say £2¼m. less than the profit which we are now looking at.

That estimate depends for its accuracy upon two unknowns—the future rate of copper production and the future course of copper prices.

As to the first of these with the advent of Bancroft Mines and the Chibuluma Company as new producers it would under ordinary circumstances be reasonable to expect a higher rate of copper production this year than last.

The future course of copper prices is not a matter about which I should care to express any firm opinion. It is related to various considerations about which there is already a lot of publicized information available to us all, such as the technical position of the metal, the relation between its current production and consumption, and the point at which pro-

ducers may be moved to take active steps to create conditions favourable to maintaining or even improving the current price level.

There appears to be some grounds for hoping that the price of electrolytic copper will not fall materially below its present level for any long period in the immediate future and, consequently, that it is reasonable to hope that the profit after taxes for the current year will not fall below the estimate of £4¼m. which I have already given you but it is obvious to me, and I hope that I have made it clear to you, that there can be no certainty on that point.

While, therefore, your Directors have thought it proper to recommend that shareholders should participate in last year's very favourable results by way of an increase in the rate of the dividend it is to be understood that their recommendations with regard to distributions for the current and future years will have to be made in the light of the then contemporary conditions—which as I have shown are certain to be much less favourable than they were last year.

Balance Sheet

Under the head of *Fixed Assets* you can see a book value of £3.1m. which shows a net increase of £.2m. as compared with the previous year. (This additional expenditure has been made partly on improvements at the Mazoe Citrus Estate, partly on additional land and plantings at our Forestry Estates and partly on building new offices at Salisbury and Bulawayo.)

The *Investment* heading at £19.6m. shows an increase of £3.1m. Of this increase one-half represents loans to finance the equipment of Bancroft Mines (leading to the creation of additional royalties). (There has been a temporary increase of half a million pounds in our Gilt-Edged holding and the rest has been variously invested.)

There is a pretty full account of the whole of these investments on pp. 4 and 5 of the report, which no doubt you will have already studied.

The Balance Sheet shows that the Market Value of quoted investments exceeded their Book Value by £15m. At March 22, 1957, the comparable excess of Market Value over Book Value for these investments was £12m. In addition there is an estimated undisclosed appreciation of at least £10m. over the Book Value of the interests in Subsidiary Companies and of the Unquoted Investments which together have a Book Value of £9.2m. There was thus a total appreciation of over £25m. on the Book Value of all the Investments taken together.

Rhodesia Railways Trust

You will have no doubt seen in the papers that the Company has recently made an offer to purchase at 60s. a share those shares in Rhodesia Railways Trust which it does not itself own. The issued share capital of the Trust is just over £2m. in shares of £1 each and of these the Company holds just over 81% leaving just over 375,000 shares held by others. The amount involved in the offer is thus about £1,125,000.

The offer is conditional upon its acceptance, by a date to be specified, by persons who are the holders of not less than 90% of the shares concerned and who are together not less than ¾ of the number of all the holders concerned.

We have now notified the Rhodesia Railways Trust that that date is to be April 15, 1957.

If then the above conditions shall not have been fulfilled the offer will fall away.

You will nevertheless like me to explain why the offer was made.

The Rhodesia Railways Trust was formed in 1899 as an Investment Trust to hold inter alia all the shares of the Rhodesia and Mashonaland Railways Companies. When, in 1947, the Governments concerned took over the Rhodesian Railways System Rhodesia Railways Trust received £3,150,000 in exchange for its equity interest therein represented by those shares. A substantial book profit thus accrued to the Trust which, by reason of the Trust's constitution was not taxable in its hands but would have thrown up a large taxable profit in the hands of The British South Africa Company had the Trust then been liquidated and its assets distributed to its shareholders. The Board of the Trust was thereupon suitably fortified and the Trust provided with an organization suitable to enable it to build up and carry on the business of a conventional Investment Trust. This, to the credit of its Directors and Management, has been attended with a considerable measure of success so that at the present time the Trust (with a nominal capital of £2m., Reserves of £2.3m., and a Debenture debt of £1m.) has a body of well spread investments with a Book Value of £5.4m. which at September 30, 1956, were valued at nearly £7¼m. For the year ended on that date it earned a profit of 17% on its nominal capital and distributed 14%.

The British South Africa Company has, as I have said, 81% of the equity of this well directed and managed undertaking and is content to continue to have a substantial interest in this important department of the investment field.

It would, at the same time, be convenient to The British South Africa Company if, without in any respect altering the Investment Trust character of the Trust's business, its Investment policy should in some respects be co-ordinated with that of The British South Africa Company—notably in relation to the extent of its dollar investments and to the relative emphasis to be placed in its general investment structure upon revenue earning and capital appreciation, without any necessity to consider whether such policies would commend themselves to the holders of the remainder of the equity of the Trust. The British South Africa Company has accordingly offered to purchase their equity at a price which the Directors consider and are advised is fair and was in fact 20% above the market price of the shares at the time when the offer was made.

It is moreover a price the proceeds of which could be reinvested in equally reputable trust company shares more profitably than if the shares were retained.

It is admittedly less than the break-up value of the Trust's holdings, the market value of which has recently been published, but the yield likely to be earned on any price greater than that offered is not sufficiently attractive to justify a higher offer.

Additions to Reserve

Coming back to the Balance Sheet:—If, now, you add together the Book Values of "Fixed Assets" and Investments you get a total of £22.7m.

If from that total you deduct the amount of the Issued Capital £13.2m. the difference is £9.5m. That represents the amount of the unappropriated profits which, up to September 30, 1956, have been invested in those assets. This explains why we have now set aside £9.5m. to General Reserve out of those Profits, leaving a balance of profit unappropriated of £2m. The amount by which the current assets totalling £14.6m. exceed the current liabilities totalling £12.6m. is £2m.

Net Assets and Commitments

Thus the Balance Sheet shows that the net current assets at the end of last year amounted to £2m. You will observe however in the report that the Company had commitments in addition to the liabilities recorded in the Balance Sheet of about £8m. These include, in addition to some lesser obligations the Company's undertaking to subscribe £4m. spread over the four years 1957/1960 in respect of the Kariba hydroelectric undertaking and a further £2m. (which has since been provided) for the finance of Bancroft Mines.

Investing in the Federation

In addition arrangements are in train for setting up a new wholly owned subsidiary to invest in property in the Federation, and for a substantial participation in the equity and loan capital of a company which has been formed in the Federation to take over and develop the Steel undertaking at present owned by the Southern Rhodesia Government. Furthermore the Company always has to have monies in hand to enable it to contribute substantially to projects calculated to add to its royalty revenues over the next 30 years of which there are at least two now under consideration, and to enable it to continue, as in the cases of the Kariba and Steel undertakings, to take its proper share in the public affairs of the Federation from which it draws so large a proportion of its Revenues. Commitments such as these can be financed either out of the Company's existing assets or out of the Company's current and future profits.

It is, as you are aware, a guiding principle of the Company's financial policy to build up as best may be during the next 30 years a substantial body of investments the income from which may to some extent compensate for the loss of the mineral revenues which in 1986 are to be handed over to the Northern Rhodesia Government. That policy will obviously be the more effectively served to the extent to which such commitments as have now been taken and may be taken in future are the more financed out of the profits of the Company.

In the implementation of that policy due regard must of course at all times be paid to ensuring that a proper balance is maintained between the proportion of the profit which may be paid to the shareholder by way of dividend and the proportion thereof which may be retained to be thus invested on his collective behalf. In these days of high taxation, and especially bearing in mind the crippling effect of the Tax on distributed profits, the retention for investment of a substantial part of the profit may well commend itself to many shareholders.

The report and accounts were unanimously adopted and the final dividend of 25%, making 35% for the year, was approved.

The retiring directors, Sir Ernest Oppenheimer, Mr. Robert Annan and Mr. H. St. L. Grenfell, O.B.E., M.C., were re-elected, and the other formal business duly transacted.

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